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The Queen's Birthday Honours List

THE first of the Queen's Birthday Honours Lists includes a number of prominent railwaymen in this country, as well as the customary recipients in other transport and closely-related industries. Outstanding in the present list is the K.C.V.O. conferred on Mr. V. M. Barrington-Ward, Member of the Railway Executive for operating matters, to whom further reference is made in an editorial article on page 649. Another Member of the Railway Executive to receive an award is Mr. J. C. L. Train, who receives the C.B.E. Mr. Train, who is the Member responsible for Civil Engineering, has carried out many inspections on all Regions of British Railways since nationalisation, covering in all over 15,000 route-miles. The Railway Executive is also represented in the list by Mr. E. G. Marsden, who receives the O.B.E. Mr. Marsden has been Secretary of the Executive since nationalisation, and previously was Secretary to the Railway Executive Committee, with which body his association dated from 1938. Overseas railwaymen receiving honours include Mr. S. M. Johnson, lately Deputy Chief Engineer (Bridges), North Western Railway, Pakistan (O.B.E.), and Mr. O. P. C. Collier, General Manager of the Eritrea Railway (M.B.E.). As with the C.B.E. conferred last year on Mr. Archibald Campbell, Chief Mechanical Engineer to the Crown Agents for the Colonies, satisfaction will be felt with the inclusion in the present list of Mr. A. C. H. Illston, Deputy Chief Engineer, Mechanical Engineering Department of the Crown Agents, as an O.B.E. The K.B.E. is conferred on Sir Harry Methven, as Chairman of the National Service Hostels Corporation, who is also Chairman of the B.T.C. Hotels Executive. A number of British railwaymen receive the M.B.E., and an O.B.E. goes to Mr. R. O. Banister, the L.M. Region Divisional Operating Superintendent at Manchester. Following the first selection from the list, which appeared in our last week's issue, a further selection appears in our Personal columns of this issue.

Colonial Engineering Conference

MR. OLIVER LYTTELTON, Secretary of State for the Colonies, will open the third Conference on Civil Engineering Problems in the Colonies at the Institution of Civil Engineers on June 16. These conferences originated in 1948, the success of the first of the series leading to a second being organised in 1950. They are intended primarily to cater for the needs of civil engineers in the Colonial Engineering Service and others concerned with similar work in the Colonies. Railway subjects have been among those dealt with at the technical sessions on each occasion, and this year will be represented by two papers to be read on June 18, one being "Notes on Relaying and Maintenance, Nigerian Railway," by Mr. E. J. B. Gahan, and the other "Rehabilitation of the North Borneo Railway," by Mr. H. Gatford. This year, also, electricity generation by water power is being dealt with in a paper on "Hydro-Electric Development in Uganda," by Messrs. C. R. Westlake and T. A. L. Paton, and will be a subject of increasing interest to those concerned with Colonial transport in view of the possibilities of associating economical generation with railway electrification.

British Transport Commission Statistics

DURING Period 4, the four weeks to April 20, certain categories of British Railways staff increased, apparently the result of the greater willingness reported recently to join the railways. In the drivers, motormen, firemen, and cleaners group, 1,032 men were recruited, against wastage of 771; among guards, signalmen, porters, and so on, there were 2,032 recruits, with wastage of 1,171; and for civil engineering conciliation and workshop staffs recruitment was 1,166 and 456 against wastage of 1,041 and 260 respectively. These figures are small compared with the totals in each category, where there have been acute shortages, but they show continuation of a trend noticeable in the preceding period. Comparison with previous years is invalidated by regrouping of grades in 1951, but the trend figures in *Transport Statistics,* which give totals for three groups of grades (salaried, operating and miscellaneous, and maintenance) show all three totals greater for Period 4 this year than last, with a steady rise since January in the operating group totals. Statistics for railway ships show that although Easter this year fell in Period 4, with 1951 Easter holiday bookings made in Period 3, passenger receipts for the period were only £285,000, against £280,000 last year, whilst receipts from cargo, mails and parcels were £425,000, against £411,000.

Overseas Railway Traffics

CANADIAN PACIFIC working expenses advanced at a greater rate than gross earnings during April and as a result net earnings for the month fell by £291,000 to £586,000. Gross earnings for the month were higher by £333,000 at £11,982,000, and the corresponding increase in working expenses amounted to £625,000 at £11,396,000. Aggregate C.P.R. net earnings for the current 17 weeks amount to £2,262,000, as compared with £2,903,000 for the corresponding period of 1951; gross earnings during the same period have improved by £3,542,000 to £47,926,000. Antofagasta (Chili) & Bolivia traffics for the fortnight ended May 30 were up by £80,550, the greatest improvement being in the second week when receipts at £210,200 were £55,960 higher. At May 30, aggregate receipts since January 1 amounted to £3,409,940, a £999,400 advance over receipts for the same period last year. Traffics of the Salvador Railway fell by c11,000

during March, but on the aggregate are still c44,000 up on traffics for the 39 weeks since July 1, 1951; aggregate traffics to date amount to c1,607,000.

Signal Engineers in France

FOR the first time since 1931 when, in the presidency of the late Mr. J. W. Punter, a visit was paid to the then French State Railways, the Institution of Railway Signal Engineers this year held its summer meeting in France at the invitation of Monsieur Louis Armand, General Manager of the French National Railways. The meeting, of which an account is given on another page, was most successful. The relay interlocking installations inspected presented interesting features of design, such as the general use of dual action push-buttons and the endeavour to make the panels as neat and small as possible. The older "combinator" type of route-lever power frame is, however, still widely used and, from the operating point of view at least, leaves nothing to be desired. As route-setting has long been general practice, it was natural that the panel installations should be based on similar principles. The latest design of enclosed facing point lock and electric detector, which secures the closed tongue of the switches directly to the stock rail, with the ball type machine for controlling automatically points in marshalling yards, attracted particular attention, not having been seen in Great Britain. The progressive spirit animating their French signalling colleagues was apparent in all that the visitors were so courteously shown.

Deceleration in the U.S.A.

A SIGNIFICANT recent development in the United States raises speculation whether the peak of railway speed in that country has been reached, and whether a general recession may be in prospect. Elsewhere in this issue it is reported that both the "Twentieth Century Limited" and the "Commodore Vanderbilt," on the New York-Chicago service of the New York Central System, are to have their overall times for the 958-mile run increased from 16 to 16½ hr. For a short time in recent years the eastbound "Century" came down to as little as 15½ hr., so that in this direction the new time represents a decline of 60 min. from the fastest. The explanations that dependability—by which, doubtless, punctuality is meant—and smoother riding, especially at night, are the reasons behind the change, emphasise that mere speed is by no means the only attraction to the potential railway traveller. It will be of interest to see whether the competing trains of the Pennsylvania route, notably the "Broadway Limited," will follow suit, and also what may be the effect on some of the ultra-long-distance high speed trains elsewhere in the U.S.A., such as the 39¾-hr. streamline services between Chicago and the Pacific coast, of which the schedules are based on an evening departure, an early morning arrival, and the intervening day and two nights spent in the train.

Improved Western Region Rail Motors

DETRIMENTAL effects may be exercised on railway traffic by the idea that branch lines not actually closed are plodding through their declining years with fossilised equipment, a pleasure to antiquaries but a poor second in comfort and convenience to modern road vehicles. A move to counter such impressions has been made by the Western Region in reconditioning two cars used on the Ealing-Greenford rail motor service, one of which is illustrated elsewhere. The new interiors benefit from attractive upholstery and panelling, ample window space with sliding ventilation panels, and general appointments on the lines of modern motorcoach practice, including seats with headrests. Circular lighting fittings in the ceiling and under the luggage racks conform with the scheme of improvement and avoid the austere appearance of bare lamps, to which even some restaurant and buffet cars are not strangers in these days. Passengers are invited to record their comments on the improvements and reactions have been favourable. A criticism that the luggage racks were too high in one car was partly based on fear that passengers would stand on the seats and soil the upholstery. Naming the cars after British birds has caused them to be viewed with an interest and even affection that no doubt will be repeated in other districts.

Advantages of Mechanical Handling

WHEN he opened the Mechanical Handling Exhibition & Convention at Olympia, London, on June 4, Sir Walter Monckton, Minister of Labour & National Service, said that mechanical handling could help industry in three ways—by reducing accident risks, by lowering costs and accelerating the movement of goods, and by liberating labour for more directly productive work. More than 53,000 accidents a year in factories were directly due to the handling of goods and materials. Of 2,000 such accidents investigated, about a quarter were caused by articles being dropped or allowed to slip from the hands, and another quarter were muscular injuries caused by lifting excessive weights or clumsy loads. The use of mechanical aids might therefore have obviated at least 1,000 of these mishaps. There was, however, a psychological aspect which ought to be studied before a management introduced more mechanical handling, and the co-operation of the workpeople in the scheme should be sought from the start, for, said Sir Walter Monckton, there was still a "certain latent and sometimes open hostility" to mechanisation.

Single-Anode Rectifiers for Traction

ALTHOUGH electric railways were among the first users of d.c. power to adopt the rectifier, it is only comparatively recently that it has been successfully carried in the vehicle. This is probably tied to the fact that only recently has the single-anode pumpless type been available to traction engineers, and although the multi-anode pumped type was tried in a car on the New Haven Railroad as long ago as 1914, it was unsuccessful, due largely to its inherent construction. Advantages of the single-anode type of rectifier are its lower arc drop and consequently higher efficiency, together with its simple maintenance, since individual tubes can be withdrawn and replaced without disturbing others. In the ignitron type of single-anode rectifier as used in the Pennsylvania locomotives described elsewhere, the cathode spot is initiated during each cycle of the a.c. voltage by means of an ignitor of refractory material immersed in the mercury, the start of the conducting period being controlled by timing the ignitor; and there is no arc during the non-conducting period of the cycle. With the other or perhaps more conventional type of single-anode rectifier, the cathode spot is continuously maintained by a pilot arc.

Meals on Wheels

IT was a wise concession of the Hotels Executive to temper the latest restaurant car price increases with half-price meals for half-fare passengers, and unfortunate for the Railway Executive that it should be the target for criticism in the Press of higher charges for which it is not responsible. Meals on trains may stimulate among the young a devotion to railways that will last through life. The pleasure begins with the walk to the car, and the possibility of loitering in a corridor connection with a foot in each of two adjacent coaches, speculating on the dramatic possibilities that would flow from a broken coupling. At table, the thoughtful mind is beguiled by the effects of relative motion, as demonstrated by attempts to transfer the contents of a lemonade bottle into a tumbler. Even after experimental evidence has demonstrated beyond doubt that it cannot be done unless bottle and glass are both held in the hand, the temptation to achieve the impossible remains, albeit at the risk of the perimeter of the spreading pool on the tablecloth coming within range of the parental eye. The crowning pleasure comes with the service of the meal, from observing the hairsbreadth margins by which stewards proceeding in opposite directions with piles of plates contrive to avoid collision. Even prunes and rice pudding assume dignity when triumphantly delivered after a passage down the aisle that might have ended at any moment in interesting catastrophe.

Operating Results in April

NUMBER 4 of Transport Statistics covers the four-week period to April 20 and closes the record of work done on British Railways during the past winter. The October estimates of an inflated traffic lasting until April have proved to be wide of the mark. Actual carryings this year have been on the low side. Increases were expected of about 1 per cent. in merchandise, of 4 per cent. in minerals, and of 3 per cent. in coal and coke. During the first 16 weeks of the year, merchandise and livestock forwardings were 242,000 tons below the same weeks of 1951, a decrease of 1·4 per cent., and 838,000 tons below 1949, a decrease of 4·8 per cent. Mineral traffic came nearer to the estimated advance with an increase of 529,000 tons on 1951, or 2·8 per cent. The National Coal Board upset the forecast by railing only 364,000 more tons of coal and coke, representing a slight increase of 0·6 per cent. By way of amends, the Board used 40,000 fewer wagons to carry the higher tonnage, raising the average load at starting point to nearly 11½ tons.

Looking next at the April period by itself, we find decreases of 811,000 tons in originating traffic (3·7 per cent.) and 81,544,000 in net ton-miles (4·6 per cent.). The number of loaded wagons forwarded was 2,589,000, a decrease of 142,000 from 1951 (5·2 per cent.). That was the lowest figure recorded by British Railways for any period in the first half of any year since 1948. In part these decreases are due to Easter holidays falling within the April period, but it is a question whether Government rearmament programmes will produce as much railway traffic as would accrue from the employment of the capital and labour, absorbed by these programmes, in normal industrial activities. This question is being asked pointedly in the United States, where during the first 16 weeks of this year railway wagon loadings decreased by 2·9 per cent., in spite of Korean war movements and a record steel output, which the Government allots for purposes essential to national defence.

The April freight train load was steady at 161 tons. The average wagon load of minerals at starting point set up a new record of 11·55 tons for the whole system, and exceeded 12 tons in the London Midland and the Eastern Regions. The average haul of 74 miles for all classes of traffic was a mile less than the distance in April, 1951, and two miles less than the haul in March this year. Pressure on railway facilities was reduced to such an extent that freight train-miles were 427,000 fewer (3·9 per cent.) and train engine-hours decreased by 107,000 (8·2 per cent.). The London Midland Region was able to dispense with 226,000 loaded train-miles (7·6 per cent.) and 62,000 train-hours (12·2 per cent.). The corresponding percentage cuts in the Western Region were 6·3 and 10·2. Apparently traffic was moving with normal freedom in both Regions.

The significant measure of movement, "net ton-miles per freight train engine-hour," improved in all Regions, except the Scottish and Southern. The all-line statistic of 1,152 has been surpassed only once, in June, 1951. The freight train speed of 8·7 m.p.h. for the whole system was the highest reached in any April period since nationalisation. As usual, the North Eastern Region had the fastest speed of 10·66 m.p.h. That Region also worked 273 wagon miles in a train engine-hour, 44 more than the all-line average of 229. In each period of the present year, this wagon-mile statistic has kept above the 1951 level, but has fallen below 1950.

An abrupt change in total wagon mileage happened in April. The March total of 371·5 million was an increase of nearly 9,000,000 on 1951 (2·5 per cent.). The April total of 334·4 million was 23·6 million below 1951, a fall of 6·6 per cent. The heavy user in March led to 3,600 more freight vehicles being set aside for repair. On April 20, about 75,360 vehicles were unserviceable. The number available for traffic was 7,600 less than on January 1, and it would seem inadvisable to allow wagon repairs to accumulate further, as they did last summer. Nearly 11,300 wagons have been withdrawn this year and only 9,028 new wagons have gone into traffic, thus reducing the stock by 2,270.

Coaching train-miles in April were 316,000 below 1951 (1·8 per cent.), whereas for the 12 weeks to March 23 they were 938,000 above 1951 (1·9 per cent.). The effect of this variation on April carryings is not known at present, but details of passenger journeys originating during the three months to March 31 are available. The total number was 238,741,000, an increase of 9,979,000 journeys on the first quarter of 1951 (4·4 per cent.). The whole of the increase was in travel at low fares. No fewer than 14,519,000 more journeys were made with excursion, weekend, cheap day, early morning, workmen's or season tickets. Journeys with full fare, monthly return and other high-priced tickets were 4,540,000 fewer and represented only a fifth of the total. The number of first class passengers was 588,000 less (9·4 per cent.). The decline in first class travel has persisted since nationalisation, but the rate of decrease slackened last year to 2·3 per cent. and for the whole year the number of first class bookings was 584,000 less than in 1950. If the downward trend continues at four times the 1951 rate during the rest of this year, a revision of the existing arrangements for providing first class accommodation may be necessary.

French Railways Summer Services

THE summer passenger timetable of the French National Railways, in force from May 18, embodies few radical improvements. The 1951-52 winter timings remain the basis, with a large number of additional holiday trains introduced from June 27. More second class *couchettes* and railcar services are provided, and there are more through carriage facilities both for internal and international traffic. The latter include restoration of the Paris-Prague-Warsaw sleeping cars in the "Orient Express"; an overnight sleeping car between Paris, Cologne, and the Ruhr; and a through ordinary first and second class coach with *couchettes* during the high season between Nyborg and Ventimiglia *via* Hamburg, Frankfurt, Karlsruhe, Kehl, Strasbourg, and Lyons.

In the South-Eastern Region, where electrification of the Dijon-Lyons section is scheduled for completion in July (which is expected to result in considerable acceleration throughout between Paris and Lyons), the virtual completion of major electrification works has enabled some speed restrictions between Dijon and Lyons to be lifted. The morning *rapide* (train 51, all classes) from Paris to the Riviera has been accelerated to cover the 122 miles frim Dijon to Lyons Perrache in 131 min., and reaches Nice (676 miles) in 13 hr. 55 min. from Paris. "Le Mistral" runs from Dijon to Lyons in 121 min., reaching Lyons, 318 miles from Paris, in 4 hr. 41 min., and Marseilles, 536 miles, in 8 hr. 32 min. The evening *rapide* from Paris (train 15, all classes), reaches Lyons in 5 hr. dead, with four stops.

In the South-Western Region, the evening *rapide* runs from Paris Austerlitz to Bordeaux in 5 hr. 35 min., a gain of 2 min., with three stops; the distance is given officially as 361 miles, though the new deviation and loops under construction at Orleans may make it actually longer. Over the heavily graded Paris-Toulouse main line the "Barcelona Express" is accelerated to cover the 443 miles to Toulouse in 8 hr. 48 min. from Paris with one stop (Limoges), a gain of 26 min., and the 601 miles to Cerbère in 13 hr. 10 min. The midday *rapide* (train 1007, from June 27) runs from Paris Austerlitz to Toulouse in 8 hr. 35 min., with five stops. There is no outstanding change in the Western Region.

Northern Region changes include the regrettable deceleration of the "Golden Arrow" by 2 min. north—and 3 min. southbound, timings between Paris Nord and Calais Maritime being now 3 hr. 14 min. and 3 hr. 17 min. respectively, which nullifies British Railways' accelerations. The Paris-Boulogne railcars which gave late afternoon services both ways between London and Paris last summer, are not restored. Between Paris and Brussels, the "Etoile du Nord" and the "Oiseau Bleu" again have exchanged names, the former now running north in the morning; it returns in the evening, incorporating a portion from Cologne onwards from Aulnoye. There are a number of fast point-to-point diesel runs between Paris, Arras, Lille,

and intermediate stations. In the Eastern Region, the "Orient Express" is accelerated by 23 min. eastbound from Paris Est to Strasbourg, covering the 313 miles in 6 hr. 37 min., with three stops, compared with 5 hr. 15 min., with two stops, by the two pneumatic-tyred steam-hauled expresses daily. On the former Alsace-Lorraine line (in the Eastern Region) there are some fast short runs on the Thionville-Metz-Strasbourg-Basle line.

Indian Railways in 1950-51

THE year ended March 31, 1951, was most satisfactory for Indian railways, according to the Railway Board administration report for the period. The Government Railways, excluding the Nizam's State, Jodhpur, Eastern Punjab, Assam, and the East Indian narrow-gauge lines, set up new records in gross earnings, passengers originating, passenger earnings, goods earnings, passenger-miles, tons originating, ton-miles, and train-miles. Moreover, the totals under the first four of these items even exceeded the highest attained by the considerably larger pre-partition railway system.

The feature of the year was the continued improvement in operation, and sustained efforts to raise its efficiency were successful and most encouraging. The higher earnings were attained despite the Assam earthquake, floods, failure of the monsoon, and the outbreak of the war in Korea, as well as a decrease in area and yield of food grains. Industrial output, however, showed a substantial increase generally, and coal-raisings totalled the record figure of 32·32 million tons. The satisfactory railway operating results were the more creditable as they were achieved with the rehabilitation programme only partly complete. This programme was referred to in an editorial article in our issue of May 23.

Gross earnings of all railways during the year totalled Rs. 264·61 crores (£198,500,000), or 2·4 per cent. higher than the 1949-50 figure. This was due to increases in both passenger and goods traffic handled to the extent of 4·4 per cent. and 3·2 per cent., respectively. After meeting all charges, including Rs. 30 crores for depreciation, but excluding interest charges, there was a surplus on the year's working of Rs. 47·65 crores (£35,750,000). Under the terms of the 1949 Convention—referred to in the article quoted above—Rs. 32·51 crores were paid to Central Revenues as dividend at the new fixed rate of 4 per cent. on the capital invested out of those revenues in the railway undertaking. The balance remaining, Rs. 15·05 crores, was allocated, Rs. 10 crores to the Development Fund and Rs. 5·05 crores to the Revenue Reserve Fund.

The following are some of the more important statistics relating to railway working in 1950-51 compared with 1949-50:—

—	1949-50	1950-51	Percentage variation
Passengers carried (millions)	*1,255·3	1,307·7	+ 4·2
Passenger-miles	*40,019·7	41,709·6	+ 4·2
Passenger earnings (crores)	*95·25	99·21	+ 4·2
Average passenger journey (miles) ...	31·9	31·9	+ 0
Freight tons carried (millions)	91·6	92·3	+ 0·8
Net ton-miles (millions)	*25,465	27,008	+ 6·1
Goods earnings (crores)	*135·69	139·77	+ 3·0
Average miles a ton of goods was carried	278	293	+ 5·4

* Revised figures

It is to be noted that there were no major changes in rates during the year. The train-mileage increased by 6·14 millions or 3·84 per cent. over the previous year, and the passenger-miles on Class I railways were 170 per cent. higher than in 1938-39. Improved operating efficiency is reflected in the rise in net ton-miles per wagon day from 402 in 1949-50 to 434 in 1950-51, and from 180 to 190, on the 5 ft. 6 in. and metre-gauge lines respectively; the corresponding net train loads increased by 18 and 6 tons. There was a slight deterioration in the punctuality of passenger trains on both gauges.

During the year under review, in accordance with the Federal Financial Integration, railways belonging to the following previously-sovereign states became vested in the Government of India: Saurashtra (Kathiawar), Rajasthan (Rajputana), Mysore, Hyderabad (Nizam's), Patiala, Travancore-Cochin, Madhya Bharat, and the Eastern Punjab States Union. These lines, exceeding 6,000 miles in aggregate length, were taken over on April 1, 1950. A total of 65·62 miles of new railway was opened for traffic during the year, and the construction of a further 17·07 miles was sanctioned. Meanwhile, there were also 250·96 miles under construction, including the 170-mile metre-gauge connection from Deesa to the newly-developed port of Kandla, on the west coast. No lines were closed during 1950-51.

The following new standard locomotives and carriages and wagons were placed in service and ordered during the year:—

—	Placed in service	Ordered
Locomotives—		
Broad gauge	144	160
Metre gauge	149	215
Carriages—		
Broad gauge	480*	391
Metre gauge	416	576
Wagons (in terms of 4-wheelers)—		
Broad gauge	2,924	2,430
Metre gauge	415	9,960

* Including 63 all-steel coaches built by Hindustan Aircraft Limited.
The indigenous wagon-manufacturing capacity amounted to about 6,000.

Four major accidents to trains occurred during the year, and were recorded in an editorial article in our January 18, 1952, issue. An earthquake on August 15, 1950, in Upper Assam caused Rs.20 lakhs (£150,000) damage to the Assam Railway. Also, on June 12 of that year 18 in. of rain fell in the 24 hr. in north-western Bengal causing about Rs. 23 lakhs damage. In other parts of the country severe damage was caused by floods.

Economy by Civil Engineering Supervision

THE official figure for the cost of maintenance and renewal of way and structures on British Railways in 1950 was no less than £47,000,000. As it is estimated that some 60 per cent. of this represents wages, it follows that the Civil Engineers are responsible for controlling through direct supervision a sum of about £28,000,000 spent annually under this heading. The urgent need for greater economy and enhanced efficiency, as well as the shortage of labour at the present time, therefore call for a maximum effort to improve that supervision with a view to reducing this large item of expenditure.

In these circumstances it is not surprising that one of the four introductory notes to "Economy in Railway Civil Engineering," the subject discussed at the Institution of Civil Engineers on November 13, 1951, was entitled "Economy by Supervision," presented by Mr. A. K. Terris. After describing the supervisory organisation of the Civil Engineering Department—with particular reference to the Eastern Region—the note emphasises the need for adequate supervision if economical work is to be obtained. The labour shortage, resulting in more work being done by contract and by casual labour, and the serious deterioration in the quality of the labour intake, make present-day supervision increasingly difficult. If these conditions persist, three courses appear possible: to strengthen the site supervision, to introduce qualified technical staff into the district organisation at an intermediate level, or to initiate practical incentive bonus payment schemes to reduce the amount of basic supervision of the inspector. They will, however, increase the inspection and measurement elements and may possibly require additional staff for the purpose. It may be remembered that in a paper recently presented to the Institution, Mr. Turton called attention to the value of such intermediate supervision as he found it on the French National Railways. In other countries, including the Dominions, it is standard practice to employ sub-

divisional officers stationed either at district headquarters or out in the districts. Incentive bonus payment schemes are fully dealt with in "Economy through Labour Productivity and Incentive Schemes," one of the other three notes introducing this general subject "Economy in Railway Civil Engineering (see our May 9 issue).

Because railway civil engineering labour is widely dispersed, it cannot be continuously supervised, and therefore it is sometimes difficult to assess the quality of the work, measure output, and fix work standards on which any control system must be based. Mr. Terris concludes by pointing out that any assessment of the efficiency of basic supervision for a particular task today must be made by comparison with the results obtained over a period of time on similar tasks, having regard to the conditions prevailing at the time of its conception and execution.

Advantages from Locomotive Standardisation

THE life of the average locomotive is 30 to 35 years, depending on the type, and it is probably true that during this period the total maintenance expenditure incurred exceeds the original cost of the locomotive. Standardisation has therefore an important function in keeping ever-rising costs to a minimum. From the manufacturing point of view, standardisation enables the maximum use to be made of jigs and fixtures, and a reduction in the preparation of drawings. The batch manufacture of various components also can be adopted to the greatest possible extent. This avoids the constant breaking down of machines, a feature which has an important bearing on the initial production costs.

Where the standardisation of locomotive parts by careful design can be applied to classes of locomotives, not only do the above benefits accrue, but there is the further advantage of providing for an interchange of parts between a greater number of engines and so reducing recurring maintenance costs. A greater interchange of parts provides for a quicker repair, while at the same time reducing the number of spare parts necessary for locomotive maintenance in both main repair workshops and running sheds, a feature which also contributes materially towards achieving a satisfactory availability figure.

Unit assemblies need not be identified with an individual locomotive, or indeed a particular class, where standardisation has been carried out between different classes. Furthermore, repairs to unit assemblies, motion details, brake gear, piston valves, boiler mountings and so on, are possible on the batch repair principle, a procedure which assists in reducing the cost of repair. However perfect an organisation for repairs to locomotives, a certain amount of delay is inevitable. Standardisation between classes reduces such delays, in that completed assemblies can be fitted to an engine which has reached the most advanced state of repair.

The standardisation of boilers between classes is of high value in making for efficiency in locomotive repair, since it reduces capital expenditure by providing for a greater interchange of boilers, thereby reducing the number of spare boilers, and at the same time assists in reducing the time taken in repairs. This is particularly advantageous where a boiler removed from an engine requires a major repair. Completion of such repairs, in many cases, is out of step with repairs to other parts of the locomotive and standardisation of boilers permits of one requiring less attention to be allocated to an engine frame in the most advanced stage of completion, thus avoiding the delay inevitable if it were necessary to refit the same boiler.

Such a situation is catered for in modern railway workshop organisations by the forecasting of locomotives for repairs well in advance of the actual date of their arrival, during which period boiler allocations are made and repairs taken in hand. Standardisation between classes provides the workshops with a much greater latitude than would otherwise be the case. Included elsewhere in this issue is an article which deals with the standardisation of locomotives on the former G.W.R., a policy formulated by Churchward and followed by his successors.

Mr. V. M. Barrington-Ward

MR. MICHAEL BARRINGTON-WARD, who in the Queen's birthday honours last week was designated Knight Commander of the Royal Victorian Order, has been a leading figure in the railway industry for over 20 years. He is the first railwayman to have a knighthood conferred upon him under the new railway régime. He was born in 1887, the son of Mark James Barrington-Ward, an Oxford man, and successively assistant master of Clifton and Canon of Truro.

After Westminster, Mr. Michael Barrington-Ward (B.-W. to his host of friends) came down from Edinburgh University with an engineering degree, and in 1907 he joined the Midland Railway. He still retains his Midland loyalty to this day, including a tremendous admiration for Cecil Paget, who gave him his first push-off in the railway service. Someone recently said—it was one of his L.N.E.R. colleagues—that B.-W. is more L.M.S. than the L.M.S. men! But until 1939 his main work was with the L.N.E.R., and he specialised in railway operating. During the war he was Chairman of the Operating Committee of the Railway Executive Committee, later becoming a Divisional General Manager of the L.N.E.R. and in 1947 a member of the Railway Executive.

B.-W. has given a great deal to the railway service. Simple dignity, charm of manner, and quiet ability are his principal characteristics. Probably no one in the service has even seen B.-W. fussed. A recent example of his modesty was when he read in the "History of The Times" the record of his late brother Robin's work as editor. "I never appreciated," he said simply, "what important work he did." Of course, he has had his critics of his operating work at the Railway Executive, and he would be the first to recognise the inevitability of this.

Operating trains and railway traffic is the essence of railway business, and it is only with experience and criticism that sound policies are made. His first task in 1948 was to decide the principles of operating to be applied to British Railways as a unified undertaking. In this difficult task, whilst incorporating the best standards of the four group railway companies, he still adhered to the guiding principles he had early learnt from Cecil Paget. Concurrently, he dealt with the position of the motive power department in the organisation, and he decided to give it independent status instead of making it an integral part of the operating department, which was the alternative. In this way, to quote his own words, he put the motive power department on the map.

Controversial though the decision was at the time, because the practices of the four groups varied, it has undoubtedly increased the efficiency of the motive power arrangements, and it is not questioned today. Apart from the work of unification, the last five years have not been easy from an operating standpoint, with the national problems of coal distribution and general freight movement, and their serious reaction on passenger train services. But on the whole, the day-to-day train services and facilities, on which the country largely depends, have been successfully carried on, and a large part of the responsibility has been Mr. Barrington-Ward's, as the Member for Operating of the Railway Executive.

A feature of his work which always gives Mr. Barrington-Ward great pleasure are the arrangements he is required to make for royal train movements, and the honour which has now been conferred upon him by the Queen is a recognition of his services. It is therefore an honour to the railway service.

B.-W. lives at Denham, in a house and grounds of charm and beauty. One has only to visit him there to see how modest and happy is his home life. No one will be more proud of the honour that has come to her husband than Mrs. Barrington-Ward. Railway work is a life's work, often arduous and distracting, but it has its compensations, as in this happy instance; and, without exception, all B.-W.'s colleagues in London and throughout the country will share his pleasure on this occasion.

A. J. P.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The Rise of the Diesel Locomotive

June 9

SIR,—Since the letter printed in your June 7 issue was written, there is to hand the annual bulletin of U.S.A. railway statistics, prepared by the Bureau of Railway Economics, Association of American Railroads. With great ingenuity the layout of the bulletin has been recast to compare the 1951 and 1950 operating results of 122 Class 1 railways in 9 statements, covering train and yard service, rolling stock, and fuel. Wherever possible, separate aggregates and averages for steam and diesel-electric working are given—a sure sign that the rise of the diesel will continue. The train-mile figures below show how rapidly the new form of motive power is superseding steam haulage:—

U.S.A. RAILWAY TRAIN-MILES (THOUSANDS)

—	1951	1950	Per cent. Increase or Decrease
Freight—			
Diesel	260,919	202,370	+ 28
Steam	259,494	304,368	− 14
Passenger—			
Diesel	195,190	174,393	+ 12
Steam	110,431	131,766	− 16

During 1952 the gap between diesel and steam train-mileage will widen every month. In April 191 new diesels were installed, while 474 steam locomotives were withdrawn from service and only a single steam engine went into traffic. Soon it will be a case of "Diesel first, the rest nowhere."

Yours faithfully,

R. BELL

Frognal, N.W.3

Electrification Systems for New Zealand

SIR,—Although it is only logical that Swedish engineers should propose a system which, I understand, gives excellent performance in Sweden, I have been astonished that alternating current of a special frequency is being recommended for New Zealand (see your May 23 issue, page 569). There is little doubt that the 425-mile Wellington-Auckland run through rather sparsely populated country excludes the use of direct current, even at 3,000 V. as I believe to be quite satisfactorily used in South Africa under similar conditions. It seems, however, that in the light of recent developments of 50-cycle alternating current schemes, the special frequency as used in Sweden is not the only alternating current system to be considered.

Although on the fixed installation side 50-cycle electrification presents severe problems, in particular as regards the single-phase load on three-phase networks and the inductive voltage drop, which is higher than for 16⅔ cycles, French engineers now seem confident that these can be solved. From the motive power point of view several excellent solutions are already available. Perhaps the most striking example is given by the Alsthom rectifier locomotive No. 8051. This locomotive, which in its mechanical parts and traction motors is essentially a d.c. locomotive as delivered in a series of 50 to the Netherlands Railways, has been able to start goods trains of 914 metric tons up a 1 in 67 grade without difficulty, and without any abnormal behaviour of the traction motors. Also, the results with the converted d.c. motor coach, using ignitrons, are, I understand, very satisfactory. It daily runs slightly over 300 miles over grades up to 1 in 50 on the Aix-les-Bains to La Roche-sur-Foron line. Yet it is an old 1924 unit, now averaging a good 30 m.p.h., all stops included, in a service with 3¾ miles average distance between stops.

Although locomotives with 50-cycle traction motors, in particular the Oerlikon Co-Co, No. 6051, and the A.E.G. locomotive with tandem motors also seem to give excellent service, it is quite according to expectations that the rectifier units are particularly successful. For high starting torque, good commutation, low brush wear, low maintenance costs, and cheap, simple, and sturdy construction, the d.c. series motor probably cannot be surpassed, unless by the three-phase squirrel-cage motor fed *via* a frequency converter, another scheme now being developed in France for 50-cycle work. In view of the simpler substations, electrification with 50-cycle alternating current might prove still cheaper than the scheme suggested for New Zealand, at the same time fitting in better with an eventual country-wide electricity distribution system and being more versatile in the choice of motive power. It seems that the same arguments were at least partly responsible for the choice of 50-cycle alternating current for main-line electrification in the Belgian Congo.

With a main line electrified with 50-cycle alternating current, there is no problem in building locomotives that can develop their full power also under 1,500 V. d.c. overhead lines. As a matter of fact, if Alsthom had had more than eight months to design and build their rectifier locomotive, I am sure they could have supplied it with additional equipment to run also at full power on 1,500 V. d.c.; as a matter of fact, this is what the 50 locomotives of the "1100" series with the same traction motors are doing in Holland now.

On the other hand, if it were desired to have the main line system carried through, up to Wellington, including the suburban area, there would hardly be any difficulty in converting the existing stock with the aid of ignitrons. Although in principle conversion with ignitrons might be possible for 16⅔ cycles, it probably would be more expensive because of its higher weight. It also remains to be seen how a traction motor, designed for d.c., would behave with rectified a.c. of 16⅔ cycles, with which the smoothing problem would be more severe than at 50 cycles.

Yours faithfully,

ALBERT G. NYMEYER

Railworld Press, Box 4081, Amsterdam, Holland

A New Charges Scheme Needed

May 30

SIR,—Amid the prejudice and misconception that constitute much of the Government White Paper on Transport gleams one salutary feature. It is the removal of the railway safety net which has existed in various guises since road competition became serious. It appeared first in the railway investment in road haulage and passenger undertakings. It was strengthened by the restriction of indiscriminate road haulage and in its latest form became known as integration. Whether planned integration is desirable or not, it is my belief that it provided convenient sand in which the railway ostrich could bury its head.

It did not need a British Transport Commission to engineer many of the successes claimed for integration: simple economics were doing it. Branch lines were closed because the roads had already abstracted the business. With the possible exception of the joint container services we have not seen the promised diversion of traffic to the means of transport most suited for its conveyance.

The reason is not hard to find: it lies in the failure to produce, when the public was prepared for violent upheaval, namely, at nationalisation, a rates and charges system that would encourage the right traffic to the right transport. Time, it may be said, did not allow this, but I suspect that it was more in deference to industry, traditionally opposed to any relative change in transport rates, that a rates structure designed primarily to influence traffic to the lowest cost conveyance, has not appeared. Thus deprived of the only equitable means of integration the B.T.C. set out on an

emasculated co-ordination in which the railways gave and the roads took. Within the railway industry, highly-graded posts on branch line investigation committees improved the promotion prospects for some of the salaried staff.

Railwaymen generally are proud of their industry to the point of sentimentality and having been thwarted of a "square deal" and tired of eternal economy, had great hopes of seeing train loads of the "cream" back on rail. What they saw was more economy, more exhortation and redundancy ingeniously mixed up with a staff shortage. Their loyalty was even recognised as a hindrance to further integration.

I have no brief for the White Paper's vagueness, but if it should become law the way is still clear to give the railways their chance. It is to be hoped they will be given freedom to design and operate a charges system that will give the public benefits technically peculiar to carriage by rail.

Yours faithfully,

GEO. F. THOMLINSON

56, Stockens Green, Knebworth

Prospects of the U.S.A. Railways

May 26

SIR,—In your May 9 issue, in an editorial article entitled "Prospects of the U.S.A. Railways" you call attention to the "serious decrease of 8 per cent. in less-than-wagonload traffic." While there has been some loss of this particular traffic by the railroads to the motor carriers, there is a disposition to neglect one feature of this decrease which has some significance, namely, that the decrease in tonnage shown for less-than-wagonload traffic, is not itself a measure of the loss to the railroads of that particular traffic. What has happened here in a measure is merely a reclassification of the traffic. A considerable proportion of this tonnage continues to move by railroad as forwarder traffic, so that the railroads have merely lost the revenues represented by the difference between the rates charged to the forwarders and the less-than-wagonload rates formerly accorded this tonnage.

This aspect is apt to be overlooked in discussions of this matter from time to time in this country also, the assumption being made that the total decrease in less-than-wagonload tonnage measures the loss to the railroad. A specific example will perhaps make more clear the point at issue here. In 1939, less-than-wagonload tonnage amounted to 14,900,000. This figure was reduced by 1950 to 10,900,000. During the same period, however, forwarder tonnage increased from 2,800,000 to 4,500,000. Thus, while it would appear that the railroads lost 4,000,000 tons of less-than-wagonload traffic during this period, actually the net loss was only approximately half this tonnage. At the same time, the statements which I have made above should not be construed as indicating that the prospects for the U.S. railways justify any undue optimism.

Yours faithfully,

HERBERT ASHTON,
Director,
Transportation, Communications & Utilities Division

Department of Commerce, Office of International Trade, Washington 25

Lightweight Diesel Train

June 5

SIR,—I note from your May 30 issue that British Railways are trying out a three-car lightweight diesel train "which will be used experimentally on public services on outer London suburban routes during 'off-peak' periods." The coaches forming this three-car train have lines reminiscent of an early 4-wheel tramcar and appear to have a performance somewhat inferior to a double-deck bus. Is this a serious attempt to recapture lost traffic or merely a means of justifying the continuance of uneconomical steam working? Surely the travelling public will demand a higher standard of travel in this day and age?

If the railway is to survive as a means of transport, it must make use of its superior potentialities in regard to speed and comfort and this experiment fails lamentably in this respect. Other countries employ diesel-electric multiple-unit trains to advantage as being eminently suited to the requirements of fast, comfortable passenger travel coupled with sturdy reliability and low maintenance costs, so why not this country?

Yours faithfully,

H. STEPHENSON

42, Penn Hill Avenue, Parkstone, Dorset

[The diesel train to which our correspondent refers is not a British Railways experiment, but the product of a private builder to whom British Railways have given facilities for service trials. If such a unit is judged suitable for work on a branch line that might otherwise be closed, travellers probably would be glad to accept the standards to which it has been built, however short they may fall of more elaborate equipment elsewhere.—ED., *R.G.*]

Publications Received

L'Année Ferroviaire 195[illegible] Paris 6e: Librairie Plon, 8 Rue Garancière. 9 in. × 5½ in. 240 pp. Illustrated. Paper covers. Price 660 fr.—The statistical information includes traffic figures for the French National Railways for 1938 and each year since the war; there are the usual condensed particulars of S.N.C.F. motive power and rolling stock and of progress in 50-cycle and other electrification. The operation of the pool of "Europ" wagons and the development of diesel traction also are described. Monsieur J. Dessirier contributes an essay on technical progress in relation to railways. Monsieur F. Battestini describes the railway material export industry in France, with particulars of representative steam, diesel, and electric locomotives and railcars and of carriages and wagons by various builders. An article by Monsieur P. Marois, Chief of the S.N.C.F. Commercial Service, deals with *gares-marchés* and the problem of perishable traffic to large cities. The 2,000th anniversary of the foundation of Paris is the subject of an essay by Monsieur L. M. Jouffroy, who in discussing the development of transport in Paris mentions Pascal as the originator of public passenger transport—the ancestor of the Régie Autonome des Transports Parisiens of today. Monsieur Maurice Bedel writes with distinction of the joys of holiday travel by train.

Railways Before the Grouping: No. 1, L.B. & S.C.R. By O. J. Morris. London: Ian Allan Limited, 282, Vauxhall Bridge Road, S.W.1. 8¼ in. × 5½ in. 32 pp. Fully illustrated. Paper covers. Price 3s.—Vivid memories of London Brighton & South Coast Railway locomotives and trains in their liveries in the reigns of Craven, Stroudley, the elder Billinton, and D. Earle Marsh, are revived by this collection of photographic reproductions, some of them unique, and all of considerable interest to connoisseurs. It is a pity that no "Elevated Electric" train is depicted nor any cross-Channel steamer or embarkation at Newhaven Harbour, nor any railway scene on a rural Sussex branch line.

Blaw Knox Angledozers.—A series of illustrated leaflets relating to hydraulic and cable angledozers for Fowler Challenger Mark III tractors and Fowler VF crawler tractors has been issued by Blaw Knox Limited. Also included are the specifications of each type together with a table of weights and dimensions, the latter being illustrated by plan and elevation diagrams.

Low Tension Rectifiers. — A leaflet describing Sentercel selenium metal rectifiers for battery charging and other purposes requiring outputs not above 12·5 amps. has been published by Standard Telephones & Cables Limited. Tables are given to assist in selecting rectifiers and transformers for small installations, and to show the size of ballast resistor required in battery charging plants. A circuit diagram of a suitable charging circuit is included.

THE SCRAP HEAP

Stunned Swans on Line

Two swans picked up on the Leeds-Sheffield main line at Darfield, after they had struck telephone wires, were carried back to a pond a few hundred yards away. They were stunned but not seriously hurt. A signalman slowed a train so that they would not be run over. —*From "The Manchester Guardian."*

Operating Hazards in East Africa

Two hundred passengers on the Kenya mail train had a rude early morning awakening when the train was derailed by a rhinoceros which was taking a pre-dawn stroll from his lair in the wild Ndi hills near Voi, on the Kenya-Tanganyika border. The train, which was gathering speed for the final run along the coast, shuddered to a halt as the three-ton rhinoceros hit the bogies. The animal was killed and the train was delayed eight hours.

This was the second game casualty on this stretch of line in the past two weeks. Previously a train ran down two elephants in one of the most prolific big-game areas in the world. Here also local stationmasters frequently are unable to attend to the signals at night because lions come to the water stand-pipes for a drink.—*From "The Sunday Times."*

Last of the "Dreadnoughts"

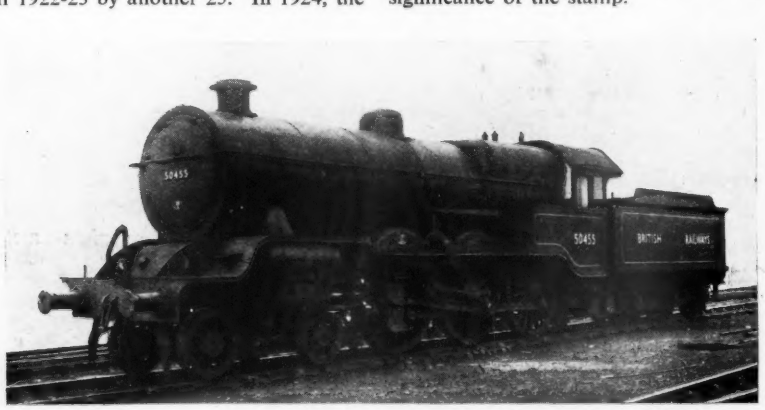
Recent withdrawal of London Midland Region locomotive No. 50455 from traffic for breaking-up after 28 years' service, during which it ran over 750,000 miles, marked the end of a line of former L. & Y. class "8" 4-6-0 passenger tender locomotives, which did sterling work and were well thought of by locomotivemen, to whom they were known as "Dreadnoughts."

Twenty 4-6-0 engines were originally built as saturated engines with Joy's valve gear and Richardson valves in 1908 and 1909, and in 1921 fifteen of these were converted to superheated engines with Walschaerts valve gear and piston valves. Also in 1921 ten further engines were built to the new design, followed in 1922-23 by another 25. In 1924, the last 20 engines of the class, making a total of 75 in all, were built with slightly longer frames and, in consequence, bogies with a 7 ft. wheelbase, as against 6 ft. 6 in. of the earlier engines.

Most of the last twenty engines were stationed at Carlisle (Kingmoor) motive power depot for a number of years, working Carlisle to Crewe trains. One engine, No. 10456, was converted to a compound in August, 1926, the h.p. cylinders outside the frames being 16 in. dia. and the l.p. cylinders 22 in. dia.

B. & O. Anniversary Stamp

On February 28 this year the United States Post Office issued a 3 cent stamp (illustrated herewith) commemorating the 125th anniversary of the granting of a charter to the Baltimore & Ohio Railroad. As soon as the issue of the stamp was announced, thousands of letters were received by the railway requesting first-day covers bearing the stamp. In one day alone 2,200 such requests were received, and for more than two weeks subsequently they came in at the rate of 1,200 or more a day, some of them from places as distant as Korea, Chile, Ireland, France, Africa, and Haiti. By the day of issue the railway had received more than 25,000 requests, and including the covers sent to a selected list of patrons, Government leaders and others, a total of 95,000 was sent out. Members of the Traffic and other departments joined with the Public Relations section in preparing the envelopes and inserting letters explaining the significance of the stamp.



The last of the Hughes 4-6-0 *locomotives built for the former Lancashire & Yorkshire and London Midland & Scottish Railways between* 1908 *and* 1924

A One-Girl Train

Miss Irene Wooldridge, finishing her breakfast cup of tea, looks out of the kitchen window of her home on Billing Station and watches for the 8.53 a.m. to Northampton to be signalled.

She is its only regular fare-paying passenger. When the Railway Executive informed Northampton Rural Council that Billing is to be closed, Mr. A. J. Mackaness, Council Vice-chairman, said: "For years only four people have used this station, and three of them are railway employees."

Miss Wooldridge's fare is 1s. 2d. single, against 9d. return by bus. "But I go by train because it gives me ten minutes extra in bed," said Miss Wooldridge. — *From the "Daily Express."*

The Fortunate Ganger

It's all good fun in the nice, warm sun,
When the soft winds blow, but, when ice and snow
Paralyse the joints and the frost-bound points
Tear the tender skin and the blood's so thin
That the nerve-ends cry with the agony,
I may be forgiven if I think of heaven
As a cosy spot by a stove red-hot,
Miles and miles away from the six-foot way.

But I walk my length, while the day gains strength,
And I often feel, as the road of steel
Runs away ahead through the cutting bed
Till it leaves my eye where it meets the sky:
"This is *my* child"—through the waste and wild
The long trains glide and I thrill with pride,
For we made a road that can take the load,
Aye, we built a line—and this bit is mine!

Straight and clean runs the line between
The green hedgerows, where the sweet wild rose
Adds its subtle share to the scented air
And the brambles twine with the shy woodbine.
A lone lark wings to his heaven and sings,
I feel the bliss of the sun's first kiss,
Then, with a sigh, reluctantly,
I wrench my eyes from the radiant skies.

For we dare not slack out on the track
And there's no excuse for a rail that's loose,
So my anxious eye roves restlessly
Over keys and joints, fishplates and points,
Until, satisfied, I turn aside.
With a "spell-oh, boys!" and we share the joys
Of a yarn, a joke and a quiet smoke
And the ecstasy of scalding tea.—A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Finances

The operation of the railways, harbour, steamship, airways, and aerodromes services during February, 1952, resulted in a surplus of £134,833. Expenditure exceeded the estimates by £921,769, mainly because of the payment of increased wages and allowances.

Railway revenue was greater in February, 1952, than in the same month of last year, but the surplus on working was only £66,207 against £375,505. Harbour revenue decreased compared with February, 1951, but a surplus of £136,231 resulted. The operation of the steamships produced a surplus of £51,247. Airways and aerodromes both showed a loss on working.

The total revenue for the month was £9,873,709 and the expenditure £9,642,924. The accumulated surplus for the eleven months of the financial year for which accounts have been completed is now £6,819,070.

RHODESIA

Increased Rates and Fares

Rates and fares, which were to have been increased from April 1, will now be increased from July 1, or as near thereto as possible.

NEW ZEALAND

Railways Commission

The Royal Commission on Railways has completed its public sittings, during the course of which it heard over 100 witnesses in the centres it visited. The Commission's report and recommendations to the Government are expected to be completed this month.

CANADA

Cape Breton Island Causeway

A causeway, three-quarters of a mile long, is to be built between the mainland of Nova Scotia and Cape Breton Island across the Strait of Canso. The Government has awarded a contract to a Vancouver company for rock-quarrying and filling the causeway. The contract calls for work to begin immediately and to be finished before September 31, 1954.

The Premier said that the first engineering estimates expected the rock-fill project to be 40 per cent of the total cost of the causeway—some $23,000,000. The contribution by Nova Scotia is $5,500,000, to cover the construction of highway approaches on both sides and highway work on the causeway. Some 5,500,000 cu. yd. of rock will be cut out of Cape Porcupine Hill for the causeway.

The causeway, long considered a necessary strategic link, will reduce by about an hour the time now needed to cross the strait, across which two ferries ply. It is expected greatly to develop the steel and coal industries of Cape Breton Island by making possible the handling of heavy freight with increased speed.

The causeway will include a railway, a highway conforming to Trans-Canada specifications and a 6-ft. pavement.

C.N.R. Kitimat Line Approved

A House of Commons committee has given approval to the construction of the C.N.R. Terrace-Kitimat branch in British Columbia. Mr. S. W. Fairweather, Vice-President for Research & Development, C.N.R., testified that the line, 46 miles long, would not only aid the great Aluminium Company of Canada project but would also open up new opportunities for other development. He foresaw Kitimat becoming an important fishing port; possible mineral developments; and the opening up of a rich farm area. Kitimat would be a gateway to world commerce for Western Canadian products. It would be another "window" on the Pacific which would help not hinder Vancouver.

The Aluminium Company has guaranteed the C.N.R. a minimum income from the branch but it is estimated that the line will pay for itself in the first five years.

UNITED STATES

Grand Trunk Western Railroad Orders

New rolling stock to the value of more than $15,000,000 is now on order for the Grand Trunk Western Railroad (a Canadian National Railways subsidiary). Delivery is expected this year of five 1,200-h.p. diesel shunters, 500 triple-hopper wagons, 300 gondola wagons, 250 box cars, four baggage cars and six steel cabooses. Equipment now on order for delivery next year includes five first class air-conditioned coaches, 175 covered hoppers, and 600 box cars.

Last year, revenue reached $57,468,718, an increase of $129,427, but mainly because of rising costs operating expenses rose to $46,778,405, an increase of $3,620,997. Net revenue from railway operations was $10,690,313 ($14,181,883). After paying taxes and fixed charges there was a net income deficit of $219,038.

Diesel Power

At the end of 1951, the Class I railways owned 17,610 diesel-electric locomotive units, with an aggregate b.h.p. of 23,561,140; Class II and Class III railways, and terminal and shunting companies, owned another 1,354 units, totalling 1,239,290 b.h.p. In a single year the Class I railways added 3,463 units of 5,119,150 b.h.p. to their stock, representing 25 per cent. more units, and 28 per cent. greater power than in the previous year. The modern 1,500 b.h.p. general-purpose units, often in multiple-unit assemblies of two, three, or four, are the most popular, and total 7,469, with another 965 of the 1,600 b.h.p. type now being built in large numbers.

The largest individual owner is now the Pennsylvania Railroad, with 1,545 units of 2,072,790 b.h.p., followed by the Atchison, Topeka & Santa Fe with 1,172 (1,605,530 b.h.p.), the New York Central System with 1,237 (1,548,160 b.h.p.), the Southern Pacific with 775 (1,071,630 b.h.p.), and the Southern System with 719 (1,001,950 b.h.p.).

Other extensive users of diesel power

"Out-of-Gauge" Haulage in Rhodesia

An abnormal load conveyed for 200 miles by Rhodesia Railways road services

are the Union Pacific (601 units), the Baltimore & Ohio (597 units), the Chicago, Burlington & Quincy and the Chicago, Milwaukee, St. Paul & Pacific (490 units each), the Great Northern (466 units), and the Chicago & North Western (455 units). Orders for diesel power are still being placed on an extensive scale.

"Twentieth Century Limited" Slowed

For some years the "Twentieth Century Limited," one of the fastest and most famous trains in the U.S.A., has been covering the 958 miles between New York and Chicago in 16 hr. For a short time the eastbound timing was reduced to 15½ hr., but was later eased in stages to 15¾ and then to 16 hr. This year the New York Central System has decided on a further 30 min. slowing down in both directions, making the time 16½ hr.; the new schedule came into effect on April 27.

Westbound, the departure from New York remains at 6 p.m., but Chicago is reached at 9.30 instead of 9 a.m.; eastbound, the train leaves Chicago at 4 p.m. instead of 4.30 p.m.; arrival at New York remains unaltered at 9.30 a.m. The apparent difference of 2 hr. in the overall times is due to the 1 hr. difference between Eastern and Central time.

The all-Pullman "Commodore Vanderbilt," which runs 30 min. ahead of the "Twentieth Century Limited" in each direction, has also been decelerated to a 16½ hr. run. Among the reasons given are that the high speeds of these trains cause excessive vibration, which disturbs the rest of night passengers, and maximum speeds over this main line are now being restricted to 75 m.p.h.

ITALY

Delays on Naples - Sicily Route

The late running of trains, which is stated to have been increasing recently, was discussed at a special State Railways conference recently. Mr. G. Di Raimondo, General Manager of the State Railways, gave as the reasons the exceptional number of passengers; overabundant crops of citrus fruit in Sicily with consequent congestion of the Sicily and Naples route by fruit specials and returning empty stock; insufficient rolling stock, and inadequate additions despite orders placed with the industry; the large number of special trains; and reconstruction and renewal of lines in arrears or not completed.

Assurances which were given indicate the possibility of an early improvement, when new rolling stock and two train ferries now undergoing reconstruction are in service. The two vessels will increase the number of ferries operating between Messina (Sicily) and the mainland (Reggio Calabria and Villa San Giovanni).

The situation is reflected in the timetable which came into force on May 18. It shows decelerations of passenger trains between Naples and Villa San Giovanni. This is also partly caused by the electrification works on the Messina-Palermo line.

When Parliament passes the Bill for the expenditure of 75,000 million lire (approximately £42,301,000) the improvement of the Battipaglia-Reggio Calabria section of the Naples-Sicily route and the Reggio Calabria-Metaponto-Bari-Foggia line will begin. The second line is intended to take over much of the citrus fruit traffic for the north, some of which will be diverted to the Adriatic coast route, relieving the Reggio Calabria-Battipaglia-Naples line.

SWITZERLAND

Loudspeakers in Coaches

Two complete train sets of the Rhaetian Railways, each consisting of a second-class coach, three third-class coaches and a restaurant car, have been equipped with loudspeaker installations enabling music, and descriptions of the scenery through which the train is passing to be broadcast. These sets are intended mainly for the conveyance of parties and may be formed into one train. The loudspeaker equipment was installed in the Rhaetian Railways workshops at Landquart.

FRANCE

Re-turning Tyres at Rueil

To minimise the time occupied in re-turning the tyres of electric locomotives, the S.N.C.F. has adopted a new technique at its Rueil depot. Normally it is necessary to remove the wheels before re-turning tyres, but by using a special pit it has proved possible to obviate this operation.

The pit is some six ft. deep and has been specially constructed to accommodate a tyre-turning machine. The locomotive is moved over the pit so that the wheel to be treated is directly over a gap in the rail. The machine is then suitably adjusted and the re-turning of the tyre is performed with the wheels still in place.

Market Station at Bercy

The Government has announced the inauguration of a general market station for foodstuffs at Bercy, the goods station for Paris Lyon. Foodstuff originating in the Mediterranean and South-Eastern Regions, and destined for the Halles (Paris central markets), will be received at Bercy in full wagon loads and sorted there according to the market destination.

From Bercy the traffic will normally be delivered by road to the appropriate market, although provision is made for collection by the ultimate consignee, if he is situated within approximately 100 miles of Paris. The use of the market station is optional, and traders can continue to handle foodstuffs at other points if they wish.

A limited company known as Samada (Société Auxiliare de Manutention Accélerée de Denrées Alimentaires) has been set up with a nominal capital of £50,000. A section of the Bercy goods station has been rented from the S.N.C.F. and traders using the premises will pay a fee to Samada. Amongst the shareholders are S.C.E.T.A. and S.T.E.F., each with a holding of approximately 20 per cent., but the S.N.C.F. is not itself a shareholder.

The market station will possess approximately 1,000 ft. of loading platform, serving both rail and road; the platform area available for sorting will be nearly five acres. Some 25 fork-lift trucks will be in use. Commercial transactions are normally forbidden on S.N.C.F. property, but it is thought possible that arrangements will be made for the sale of foodstuffs by sample, and the diversion of goods to the purchasers at the market station.

Food Transport Rates

The S.N.C.F. is seeking approval for reducing rates on the carriage of foodstuffs under certain conditions. It proposes to allow substantial reductions for the transport of butter, cheese, fruits, vegetables, eggs, fish and poultry provided the consignments are packed carefully in a way that affords guarantees against damage. Some reductions would be from 20 to 25 per cent.

Rapid Realignment on Viaduct

As a result of the repair of the coping on the Magieure Viaduct between Montluçon and Bourges the track had shifted, and a speed limit of 19 m.p.h. was imposed. The track had to be moved by as much as 4 ft. over a distance of nearly 1,000 ft., and a gang of less than twenty men accomplished the work in two days. This enabled the speed restriction to be removed 48 hr. after the work had been begun.

WESTERN GERMANY

More Typewriter Compartments

Typewriter compartments are now available on 34 long-distance trains.

More Through Coaches to Switzerland

More through services operate between Bavaria and Switzerland since May 18, when the summer timetable was introduced. They will include, during the high season, through coaches between Munich and Milan *via* Lindau, Zurich, and the Gotthard; between Munich and Chur *via* Lindau, Zurich, and Sargans; and also, during the Bayreuth festivals, between Zurich and Bayreuth.

Reconstruction of Bruchsal Station

Bruchsal, the junction of the Karlsruhe - Heidelberg - Frankfurt-on-Main line with the line from Stuttgart, 13 miles north of Karlsruhe, was an important target for air raids during the war. In one attack the station was damaged beyond repair, and the ruins had to be demolished for safety.

The construction of a new station was begun in December, 1950. So far, only the central part has been opened, containing the most essential public services. Not until 1954 will the new building be complete, with a separate multi-storey building comprising offices and staff dwellings.

Individual Axle Drives

A symposium of a hundred types for electric locomotives and motor coaches

JUST as the nose-suspended motor marked a vital step forward in electric traction from the old gearless locomotives, in which the axle formed the armature shaft, as in the old New York Central and Milwaukee locomotives, so did the individual axle drive bring at one stroke the possibility of large and powerful electric locomotives without the hitherto prevailing certainty of great tribulation. In this direction its most immediate advantage was not that it eliminated the nose-suspended motor of heavy weight, but that it swept away all the rod drive attempts, with which designers had landed themselves in complications in the period 1911-21.

Individual axle drives, even of the most elementary kind, not only allowed all the weight of the motors to be springborne, which rod drives already did, but they introduced a flexibility in the drive which did away with the very strong vibrations in rod systems, which, because of the even turning moment of electric motors, were much different in their characteristics from the simple rod drive of reciprocating steam locomotives. They made the big electric locomotive a practical proposition.

Improved Locomotive Layout

Compared with the nose-suspended motor, individual axle drive allowed all the weight to be springborne instead of half; and it gave greater flexibility in the drive, for very few nose-suspended installations of the 1920s had resilient gearwheels. Also, drives of this type allowed motors up to the limit of the power which could be absorbed by axles loaded to the normal maximum of 20 to 22 tons, and withal gave a much more convenient motor construction and locomotive layout. As an example of 25 years ago, one may consider the Deutsche Reichsbahn single-phase series "51" of double-jackshaft 2-C-2 type, with one 3,000-h.p. (one-hour) motor with a casing diameter of over 10 ft., built in 1926, in relation to the eight-motor 2-Do-1 "E.21" series of 4,000 h.p. (one-hour) with Bergmann individual axle drive of this period.

Just as the 1920-30 decade in diesel traction was one of experimenting with and finalising transmission systems, so in electric traction the same ten years were characterised by the gradual development of better individual axle drives, and consequent motor arrangements and design, and the gradual elimination of rod drives. In high powers these began with quill drives like that of Vincent Raven's Metrovick 2-Co-2 locomotive for the North Eastern Railway in 1921-22; and with the first series of Buchli/Brown Boveri link drives in the Swiss Federal 2-Co-1 locomotives about the same time, the latter forming a direct comparison with equivalent 2-C-1 rod-drive locomotives.

Coincidently with the increase in output of nose-suspended motors, with or without forced ventilation, endeavours were made to improve the position in these applications; and in the Austrian Federal Bo-Bo single-phase "1170" class the carcase of a nose-suspended motor was scarcely altered and a springborne motor produced, along with a form of helical-spring quill drive suited to small wheel diameters. Sécheron and Westinghouse systems developed this idea, which became suited to either small or large wheel diameters.

The number of systems and variations became legion, and up to the time war began the rate of new types and applications had scarcely slackened off. Pretty well all the older systems were described and illustrated in 1933 in a reprint, *La Commande Individuelle des Essieux,* of articles which had appeared in the French journal *La Traction Electrique,* by Adolphe-M. Hug, who had been chief of electric traction on the Netherlands East Indian Railways at the time electrification was introduced in 1925. Hug maintained his interest in this subject; and after the war set out to collate all the information possible about individual axle drive systems that had been evolved and applied from 1934 onwards. The result was a book with the same title as the earlier reprint, and published last year.* This is complementary to the old reprint of 1933.

In the French language, Hug sets out not to criticise one system or another, but to record and describe, with illustrations, every system that had been used from 1934 up to the end of 1949, which he does in 320 pages and with the aid of 388 illustrations. It is true that various advantages and disadvantages are mentioned, but only by the way; and no general conclusions are drawn as to best principles or types.

Hug's first reprint of 1933, and much of this book of 1951, are concerned with drives applied to large-wheel rigid-frame locomotives. But a post-war tendency has been to build high-power bogie locomotives where rigid-frame designs had hitherto been in favour. In one sense this has necessitated a fresh development of individual axle drives, because mechanisms became necessary which would transmit high powers to wheels of comparatively small diameter, and from motors located between the wheels. For example, the Swiss Bo-Bo single-phase locomotives transmit up to 1,000 h.p. per axle on a 20-ton axle load with a wheel diameter of 49 in., which is done by the Brown Boveri disc drive. In France, the Alsthom Co-Co 1,500-volt d.c. locomotives of the S.N.C.F. transmit 725 h.p. per axle on a 17-ton axle load with a wheel diameter of 49 in., the means here being the Alsthom link drive with Silentbloc bushings. More ordinary Bo-Bo locomotives also are now often fitted with such drives in place of the nose-suspended motor and single reduction gears, for power transmitted here, too, sometimes exceeds 700 h.p. per axle.

* *La Commande Individuelle des Essieux.* Adolphe-M. Hug. Basle: Editions Birkhaeuser S.A. Price: Sw. fr. 44

Changes in Motors

Motors themselves, of course, have changed to suit this bogie construction; for in place of being high up in the frame and driving downward, and having almost unlimited space, they are now partly between the wheels, and in general shape are similar to the conventional nose-suspended type, though entirely springborne. High power within the now restricted space and weight is obtained partly by advances in armature and gear design and in commutation, and partly by substantial forced ventilation. This subject of motors, though an aside to the subject of individual axle drives, may well be touched on here, for Hug's book itself has numerous drawings and illustrations of motor installations.

Coincident with this general trend in electric locomotive practice there has been a less ostentatious, but perhaps equally wide, advance in motor coach and train technique, here, again, bound up a good deal with new types of bogies. Indeed, one cannot divorce the drive system from the class of motor and type of bogie; and Hug's book is invaluable for the many illustrations of new types of bogies, though one consistently wishes they were of larger size. Many examples of motor coaches and multiple-unit trains have completely springborne motors and individual axle drives with wheels of one metre or less in diameter, though of course with much lower horsepower—more of the order of 200 to 225 h.p. per motor in multiple-unit trains. Increase in the number of double-reduction gears with nose-suspended and springborne motors between the track wheels is noted.

Hitherto all individual axle drives, whether for locomotives, motor coaches or multiple-unit trains, have been based on the use of springs (helical, laminated or rubber), articulated rods, or Oldham joints. But a new form has been evolved on hydraulic principles, and an hydraulic differential has been developed for application to several locomotives and tractors, and may prove to be the next step in development.—B.R.

Pennsylvania Railroad Rectifier Locomotives

Design with single-anode Ignitrons applicable to existing low-frequency or to industrial frequency single-phase systems

EXPERIMENTS with rectifiers in railway vehicles were carried out in the United States as early as 1914, when a motor coach running on the 25-cycle, 11,000-volt system of the Newhaven Railroad was equipped in this way. The first world war put a temporary end to the experiment and the motor coach was taken out of service after it had run 22,000 miles.

In later years the development of the mercury arc rectifier brought a revival of interest in this method of operating motor coaches or locomotives on railways with an alternating current power supply to the overhead line. The most important stage so far in the evolution of this form of rectifier has been the introduction of the pumpless type, with its advantages for railway application arising from the saving in auxiliary machines. During the second world-war there was further progress in the construction of single-anode rectifiers. The possibilities they offered of convenient installation in railway vehicles, combined with the fact that individual units could be changed in the event of a failure, led the Westinghouse Electric Corporation to undertake lengthy experiments investigating the behaviour of Ignitron type single-anode rectifiers in conditions of oscillation similar to those met with in railway service. Eventually it was established that a standard Ignitron equipped with modified baffle plates was not subject in these conditions to failures of the arc to strike due to splashing of the mercury pool.

At this stage the collaboration of the Pennsylvania Railroad was sought and a motor coach was equipped with four Ignitron rectifiers. A special transformer was fitted, having a centre-tapped secondary winding to which the common return from the two traction motors was connected. A pair of Ignitrons in parallel was connected to each end of the secondary, so as to provide full-wave rectification. Control was by resistances and series or parallel connection of the two motors as in ordinary d.c. practice, but provision was made for using a transformer with tap switches at a later stage of the experiments. Trials of the motor coach began on July 15, 1949, and the vehicle went into regular service on October 26 of that year. During the tests it ran for long periods with only one rectifier of each pair in action, and on some occasions was operated with half-wave rectification.

The success of the trials led the Pennsylvania Railroad in 1950 to order from the Westinghouse company two freight locomotives equipped with Ignitron rectifiers and d.c. motors in place of two locomotives with a.c. motors as had been intended originally. Both are two-unit locomotives rated at 6,000 h.p., one having two-axle and the other three-axle motor bogies. Standard d.c. motors as fitted to the Baldwin-Westinghouse and Fairbanks Morse diesel-electric road locomotives are used in both types. Principal dimensions and the interior layout of one unit of the two-axle bogie locomotive—2 (Bo-Bo-Bo)—are shown in Fig. 1. Both have a continuous tractive effort rating of 132,000 lb. at 17 m.p.h., with a factor of adhesion of 17·6 for the 2 (Bo-Bo-Bo) and of 18·1 for the 2 (Co-Co). Starting tractive efforts at 25 per cent. adhesion are 187,750 lb. and 182,000 lb. respectively. Total weight of the 2 (Bo-Bo-Bo) is 335 tons and of the 2 (Co-Co) 325 tons, so that the weights per driving axle are 28 tons and 27 tons respectively.

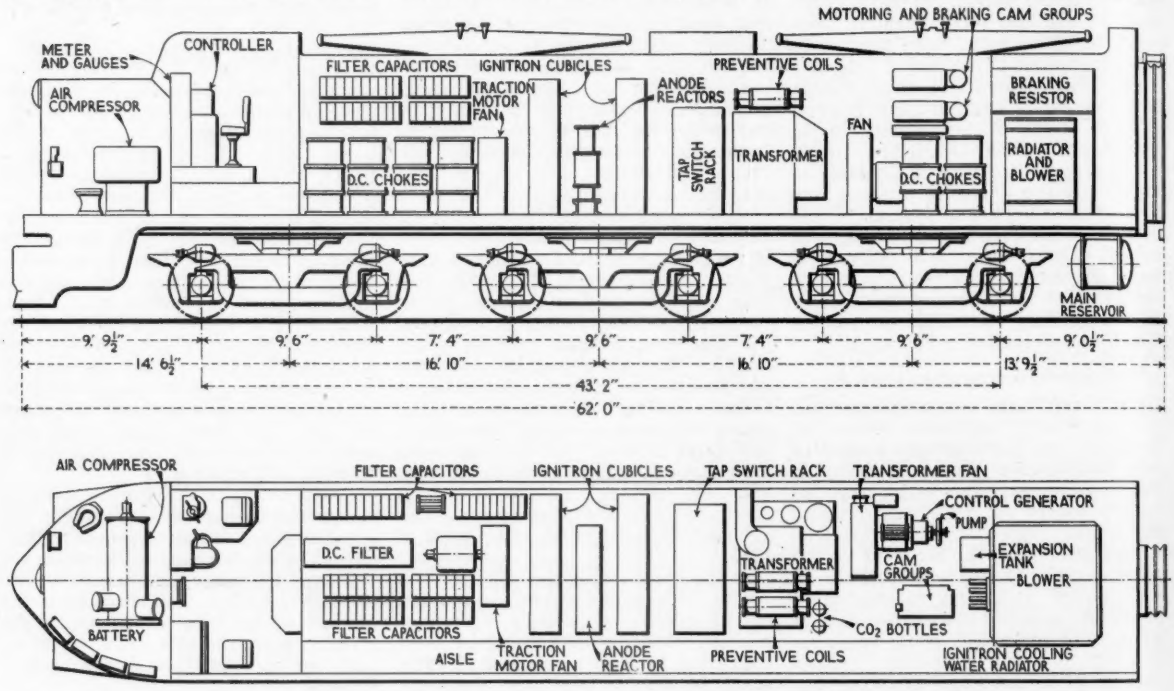


Fig. 1—Arrangement of electrical equipment in one unit of the locomotive

In these locomotives the Ignitron rectifiers and associated apparatus are used to convert energy received from an 11,000-volt, 25-cycle line to d.c. for the operation of conventional traction motors. The Ignitron rectifier is a mercury-arc device employing an ignitor to initiate the arc at each positive half-cycle, and to permit the arc to cease at each negative half-cycle.

A transformer similar to that in an ordinary a.c. locomotive is used, except that the secondary is provided with a centre tap, with accelerating taps on both

sides of the centre. Because only one-half of the secondary is used for each half cycle, this winding is approximately 45 per cent. larger than it would be for a single-phase series motor design.

Full-Wave Rectification

As shown schematically in Fig. 2, each traction motor is supplied with d.c. by two Ignitrons connected to form a full-wave rectifier. All motors are permanently in parallel and their return circuits are connected to the transformer centre tap. A d.c. reactor (not shown in Fig. 2) is connected in each motor circuit and limits the ripple to approximately 30 per cent. There is also a reactor in the anode circuit of each Ignitron. Filtering was provided to the maximum thought likely to be required, but experience with the locomotives in service has indicated that the d.c. filter could in fact be removed, and the a.c. filter reduced by half.

There are two Ignitron cubicles per locomotive unit. Each Ignitron is mounted by a resilient structure which holds the tube at approximately its centre of gravity. The mounting structure itself is fastened to insulating bolts, thus leaving the cathodes insulated from earth. These tubes are standard except for some special mercury baffling. At the upper left of the illustration of a cubicle on page 658 are seen three firing circuit controls, and at the upper right there are six anode circuit-breakers.

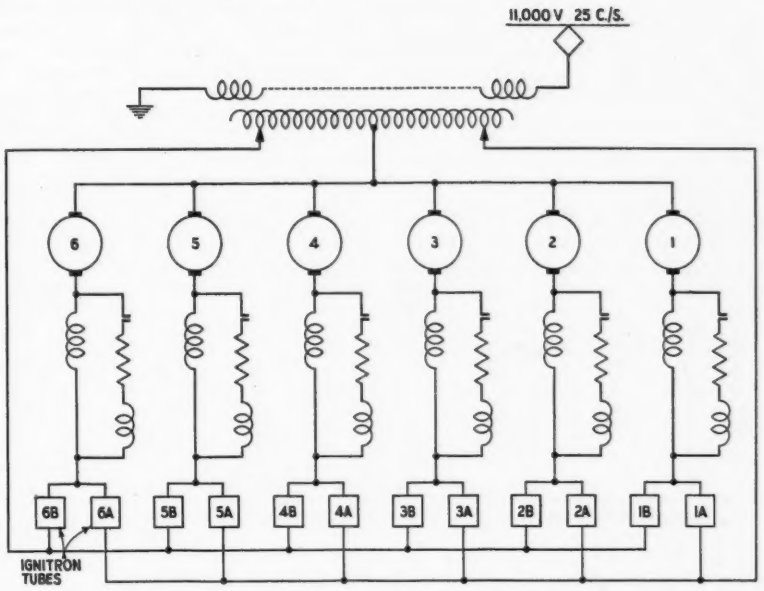
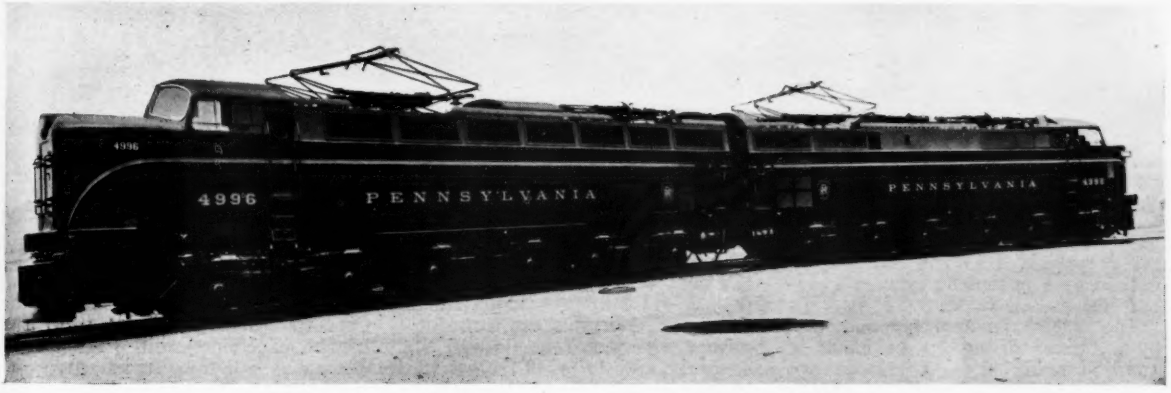


Fig. 2—Simplified circuit diagram of rectifier and motor connections



Two units coupled to form a 6,000 h.p. locomotive with the 2 (Bo-Bo-Bo) wheel arrangement

While using single-phase current for railway traction, no heavy arc-backs have been experienced in several years of testing in the Westinghouse laboratories and two years' operation of the experimental multiple-unit coach. If an arc-back occurs, it is immediately extinguished at the next zero point on the voltage wave, and being a single-phase circuit, there is no other voltage present to reignite the arc independent of the ignitor itself. Since the load is composed of d.c. series motors, there is no possibility of reverse power from this source.

Protective apparatus is provided to short the ignitor circuit and open the anode breaker magnet valve circuit when an overload occurs. This results in the overload current being interrupted within the Ignitron tube, because the overload trip operates in one-half cycle, and the anode breaker takes 1½ cycles to open. Therefore, after an overload operation, the anode breaker opens without an arc. The breaker is a new design rated 1,200 amp. a.c. or d.c., with die-cast parts. It has air-core blowout coils, which have proved especially effective on d.c. because there is no residual flux; and on either a.c. or d.c. they have the feature of forcing the arc to the centre of the arc box instead of burning the sides.

The traction motor control system achieves voltage variation by a combination of transformer tappings and adjustment of the point in the half-cycle at which each ignitron fires, the latter being obtained by phase-delay in the ignitor circuit. On certain notches, also, the motor fields are diverted by means of resistances in series with inductive shunts. A total of 35 motoring notches is provided.

For rheostatic braking the motor fields are excited in series from two Ignitrons, and a fixed braking resistor is connected across each armature. An over-temperature thermostat is arranged in each braking resistor circuit. Braking is controlled by variation of the field-excitation current, using a combination of transformer tappings, phase-delay of the Ignitrons, and a resistance of adjustable value in series with the field windings (Fig. 3). There are 14 braking notches.

The principal auxiliary machine consists of a 29-h.p. motor driving a control generator, transformer blower, and centrifugal pump for circulating the Ignitron cooling water. As well as ventilating the radiator for the transformer coolant, the transformer blower cools the tap switch group, anode circuit

reactors, and motor current smoothing chokes. During running the tap switch rack cubicle is completely closed except for the arc chute openings. It is ventilated by approximately 3,000 cu. ft. of air per min., which is expelled through the arc chutes. The control generator output is 45 volts, 60 amp.

The radiators in the cooling system for the Ignitrons are ventilated by an induction motor blower rated at 35 h.p., 1,450 r.p.m. This motor drives an axial flow fan which draws air through the radiators and then passes it through the braking rheostats, which are mounted directly over the fan. Air is expelled through the roof. When rheostatic braking is in use, shutters are opened by a pneumatic cylinder to bypass the radiators.

The traction motors are ventilated by a blower driven by an induction motor running at 1,450 r.p.m., and developing 43 h.p. In the locomotive with two-axle bogies, the ventilating duct in the underframe feeds air to each bogie through the pivot and into the bolster, from which it is supplied to the two motors. The 2(Co-Co) locomotive has direct communication from the underside of the duct to the motors by means of a sliding connection.

The traction motors are rated at 500 h.p. They have six main poles and interpoles. Both armature and field windings are Silicone-insulated. Roller bearings are used on the armature shaft and sleeve bearings on the axles.

A Westinghouse compressor for the air brake and other air supplies is carried in each unit, and is driven by an induction motor. During the starting period the compressor is unloaded, and pumps against air pressure only when it is up to speed. At 750 r.p.m., each compressor supplies 22 cu. ft. per min. displacement.

Carbon dioxide protection against fire is provided by four 50-lb. tanks of CO_2. The apparatus compartment is provided with a six-foot fire wall adjacent to the aisle to retain the gas when expelled around the electrical equipment. Several discharge nozzles are located at strategic points. The blowers are shut down by the discharge of CO_2. While the transformer blower is slowing down, the reactors ventilated by this blower are filled with CO_2. The traction motor blower has its intake shut off completely when the CO_2 is discharged.

If a fire is not extinguished by the gas in the unit where it occurs, the gas from the other unit may be used by opening a cock at the rear end of the unit not in trouble. In addition to this equipment, portable CO_2 extinguishers are provided Tests preliminary to the railway company's acceptance trials indicated that the locomotive had ample margin in both motoring and braking performance. The value of having all motors in parallel was demonstrated on one test when, because of oil on the tread of the lightest-loaded axle, slipping occurred and this axle balanced at a speed of 20 m.p.h. while the locomotive was running at 16 m.p.h. Consequently, no slip relays have been provided.

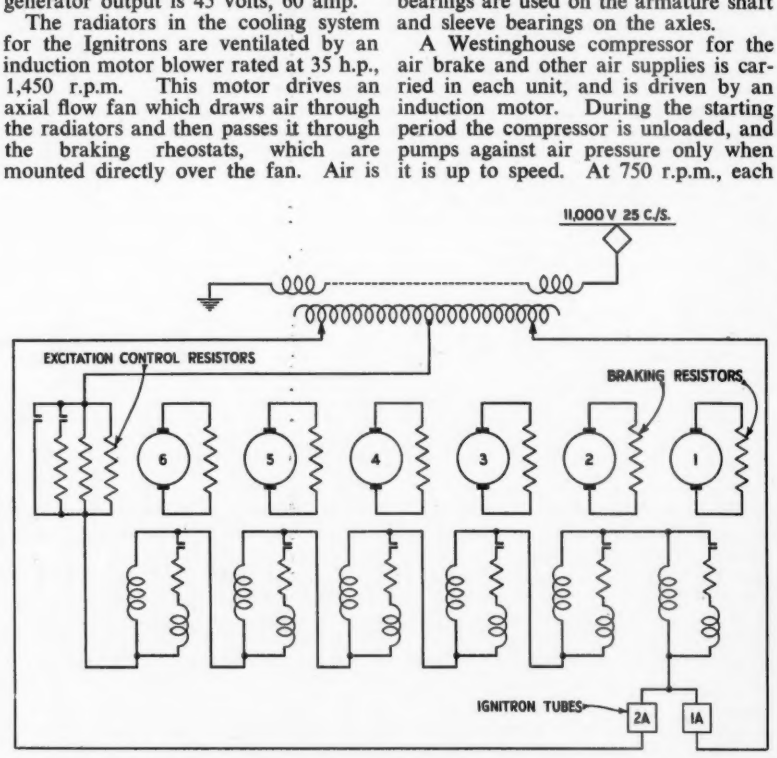


Fig. 3—Ignitrons connected for excitation of traction motor fields in series during rheostatic braking

One of the rectifier cubicles, showing the six Ignitrons

In a paper presented to the American Institute of Electrical Engineers by Messrs. C. C. Whittaker and W. M. Hutchison, of the Westinghouse Electric Corporation, the authors suggest that further experience with this type of locomotive will show its advantages on existing single-phase a.c. systems. Its application is not limited, however, to 25-cycle operation, but it is equally adaptable to the ordinary industrial frequencies of 50 or 60 cycles now being adopted for traction.

ELECTRIFICATION IN AUSTRIA.—Although substantial cuts were made in the Austrian budget for 1952 when it was revised in April, the total of 390 million Sch. (approximately £13,928,000) originally earmarked for the continuation of the electrification programme was left unchanged. This has enabled the conversion of the last section of the western main line, from Amtstetten to Vienna, 79 miles, to be proceeded with. It is expected that the electrification of the running lines will be completed early in 1953. Conversion of the other lines, including yards and sidings, will take about six months longer. Subsequently, electrification of the main line from Wels, 15½ miles south-west of Linz on the Linz-Salzburg main line, to Passau, on the Bavarian frontier, 51½ miles, is to begin. The next conversion will be the mountain line from Bischofshofen, 33½ miles south of Salzburg, on the Salzburg-Innsbruck main line, to Amtstetten, 136 miles. The projected electrification of the main line to the south, Vienna-Semmering-Bruck-Klagenfurt - Villach, and the main line to Graz branching off at Bruck, 231 miles and 33½ miles long respectively, will have to be postponed. The conversion of the Villach-Tarvisio link, already in hand, is expected to be complete by May, 1953. At Tarvisio, connection is made with the section electrified as far as Udine (58 miles) of the Italian State Railways line to Venice. At the same time a large-scale development of electric power supply is taking place. The great barrage lake, with a capacity of 529,755,000 cu. ft., which is being formed of the Weiss-See, a lake west of Zell-am-See, in the Tauern range, between Innsbruck and Salzburg, will be completed this year. This barrage lake was referred to in our March 30, 1951, issue.

G.W.R. Locomotives, 1901-1951

Continuity of design leading to standardisation

By K. J. Cook, O.B.E., M.I.Mech.E., M.I.Loco.E.,
Mechanical & Electrical Engineer, Eastern and North Eastern Regions

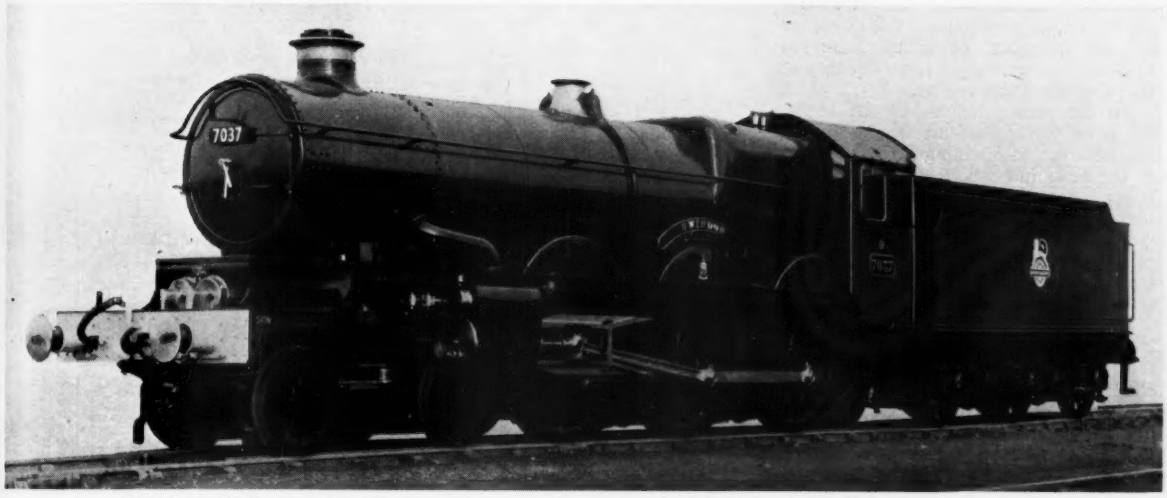
THE year of the Festival of Britain was one which invited retrospective surveys over century or jubilee periods, and one such period of interest to locomotive engineers was the lapse of 50 years since Churchward committed to paper the outline of his project of locomotive standardisation, the past year virtually seeing the fruition of his vision.

Fifty years is not an unusually long period for such a scheme to become fully effective. Moreover, it is a sobering thought that, when such a scheme is begun, some 20 to 25 years will elapse before it attains ascendancy over the old, seeing that the life of the modern locomotive is from 30 to 50 years, unless obsolescence arises. Until the old order becomes a minority, spare part stocks may not be reduced, but may actually form an entire addition to existing needs.

Large Engine Types

For Churchward the first needs were for large engine types, which have generally been a C.M.E.'s fancy, but the outstanding feature of Great Western locomotive practice over the past 50 years has been continuity of design, freely accepted by his successors, enabling progressive large engine needs to be met by relatively small developments of the standard engines, and the policy of standardisation to be continued by extending the principles to smaller types.

Thus Collett followed Churchward by developing the "Star" to "Castle" engines in 1923, and to the "King" class in 1927, virtually combining the "Saint" and "4300" classes to form the extensive "Hall" class in 1924, and then gave his attention to producing an equally comprehensive range of smaller engines which met nearly all the remaining needs of the line. He spent many hours contemplating a photographic chart of G.W.R. engine types with the object of



The "Castle" class 4-6-0 locomotive, developed by Collett from the "Star" class in 1923

One of the later batch of "28xx" class 2-8-0 locomotives, first introduced by Churchward in 1903

telescoping these into the smallest possible number of classes. An incidental addition arose out of the absorption of the coal-carrying lines of South Wales into the G.W.R. in 1922. As a result he designed a type rather foreign to the G.W.R., an 0-6-2 tank engine, but which incorporated G.W.R. standard boiler, pistons, piston valves, wheels, and other parts.

Hawksworth, closely associated with both Churchward and Collett, produced a slightly modified "Hall" class and developed it into his "County" class. He also designed the last small engine classes and completed the picture with one exception. This was a light six-coupled tender engine to release the veteran Dean tender goods engines. Nationalisation became effective when this was on the point of maturing, and it was decreed that it should not proceed, but that the L.M.R. Class "2" 2-6-0 engine, as forerunner of the British Railways standard 2-6-0 Class "2" engine, should be built in lieu. Tests of this engine indicated the necessity of "Swindonising" the smokebox so as to obtain full steaming capacity, and when this was done, the cylinder diameter could be increased and the engine brought to an equality in traffic of the Dean engine.

To the author has fallen the happy lot, over nearly 30 years of the period, of assisting and directing the production of the new, and supersession of the old. It will be evident from the foregoing that there are two main groups of modern Great Western engines, comprised of the large and small locomotives, the principal details of which are shown in Table 1.

The building of almost annual batches of "Castle" class engines, with their greater boiler capacity, tractive effort, and high route availability, in addition to the 30 "King" class for the heaviest working over limited routing, catered for the passenger working of both "Stars" and "Saints." These latter, the most sparkling of the Churchward era and now over 40 years of age, are therefore nearing extinction. Nevertheless, they are at the moment included in Table 1, which gives details of 3,318 engines in 24 classes out of a total Western Region stock of 3,776. The elimination of the "Stars" and "Saints" reduces the classes to 22. The number of classes could have been reduced considerably further were it not for weight and load gauge restrictions over many routes. For the purpose of this article the territory covered is regarded as that of the former G.W.R.

Table 1 cannot convey an adequate picture of the degree of standardisation of components as a few features only are evident. Some further details may therefore be of interest. The valve gear of the four-cylinder engines differs entirely from that of the two-cylinder arrangement, although in this respect the "Star" and "Castle" are practically identical. This also applies to crossheads, coupling rods, connecting rods, crank axles, springs, and bogies. The valve gear of the "Kings" is almost identical with that of the "Stars" and "Castles."

TABLE I

Engine		Cylinders			Valves	Valve gear	Motion	Coupled wheel diameter	Length of rod centres				Tractive effort	Boiler		Smokebox		Route classification	Power classification	No. in class
									Coupling			Connecting								
Class	Type	No.	Bore	Stroke					L	I	T			Class	W.P. lb./sq. in.	Type	Dia.			
			in.	in.				ft. in.	ft. in.	ft. in.	ft. in.	ft. in.					ft. in.			
"Star" ...	4-6-0	4	15	26	PV 8 in.	Walschaerts	2-bar	6 8½	7 0	—	7 9	Out 8 0 In 7 10	27,800	A	225	Drumhead	5 3½	Red	D	23
"Castle" ...	4-6-0	4	16	26	PV 8 in.	Walschaerts	2-bar	6 8½	7 0	—	7 9	Out 8 0 In 7 10	31,625	H	225	Drumhead	5 6½	Red	D	168
"King" ...	4-6-0	4	16½	28	PV 9 in.	Walschaerts	2-bar	6 6	8 0	—	8 3	Out 8 10 In 8 4	40,300	W	250	Drumhead	5 10½	Double red		30
"Saint" ...	4-6-0	2	18½	30	PV 10 in.	Stephenson	2-bar	6 8½	7 0	—	7 9	10 8½	24,395	A	225	Drumhead	5 3½	Red	C	16
"Hall" ...	4-6-0	2	18½	30	PV 10 in.	Stephenson	2-bar	6 0	7 0	—	7 9	10 8½	27,275	A	225	Drumhead	5 3½	Red	D	329
"County" ...	4-6-0	2	18½	30	PV 10 in.	Stephenson	2-bar	5 8	7 0	—	7 9	10 8½	27,580	O	280	Drumhead	5 6½	Red	D	30
"Grange" ...	4-6-0	2	18½	30	PV 10 in.	Stephenson	2-bar	5 8	7 0	—	7 9	10 8½	26,875	A	225	Drumhead	5 3½	Red	D	80
"Manor" ...	4-6-0	2	18	30	PV 10 in.	Stephenson	2-bar	5 8	7 0	—	7 9	10 8½	25,340	N	225	Drumhead	5 3½	Blue	D	30
"47xx" ...	2-8-0	2	19	30	PV 10 in.	Stephenson	2-bar	5 8	6 6	6 6	7 9	10 10½	30,460	U	225	Drumhead	5 9½	Red	D	9
"43xx" ...	2-6-0	2	18½	30	PV 10 in.	Stephenson	2-bar	5 8	7 0	—	7 9	10 8½	25,670	D	200	Drumhead	5 3½	Blue	D	225[1]
"51xx" ...	2-6-2T	2	18	30	PV 10 in.	Stephenson	2-bar	5 8	7 0	—	7 9	6 10½	24,300	B	200	Drumhead	4 9½	Blue	D	259[2]
"28xx" ...	2-8-0	2	18½	30	PV 10 in.	Stephenson	2-bar	5 8	7 0	5 5	7 9	10 8½	34,380	A	225	Drumhead	5 3½	Blue	E	167
"42xx" ...	2-8-0T	2	19	30	PV 10 in.	Stephenson	2-bar	4 7½	7 0	6 0	7 0	10 6½	33,170	D	200	Drumhead	5 3½	Red	E	205[3]
"45xx" ...	2-6-2T	2	17	24	PV 8 in.	Stephenson	2-bar	4 7½	5 6	—	7 6	6 7	21,250	E	200	Drumhead	4 6½	Yellow	C	168
"56xx" ...	0-6-2T	2	18	26	PV 8 in.	Stephenson	3-bar	4 7½	7 3	—	8 0	6 6 0	25,600	B	200	Drumhead	4 9½	Red	D	200
"22xx" ...	0-6-0	2	17½	24	Slide	Stephenson	2-bar	5 2	7 3	—	8 3	6 2	20,155	K	200	Drumhead	4 9½	Yellow	B	120
"57xx" ...	0-6-0T	2	17½	24	Slide	Stephenson	2-bar	4 7½	7 3	—	8 3	6 2	22,515	P	200	Built-up	4 9½	Yellow	C	863
"94xx" ...	0-6-0T	2	17½	24	Slide	Stephenson	2-bar	4 7½	7 3	—	8 3	6 2	22,515	K	200	Drumhead	4 9½	Red	C	115
"54xx" ...	0-6-0T	2	16½	24	Slide	Stephenson	3-bar	5 2	7 4	—	7 4	5 11	14,780	F	165	Drumhead	4 6½	Yellow	A	25[4]
"64xx" ...	0-6-0T	2	16½	24	Slide	Stephenson	3-bar	4 7½	7 4	—	7 4	5 11	16,510	F	165	Drumhead	4 6½	Yellow	A	90[5]
"16xx" ...	0-6-0T	2	16½	24	Slide	Stephenson	3-bar	4 7½	7 4	—	7 4	5 11	18,515	Q	165	Drumhead	4 6½	Uncol.	A	50
"1366" ...	0-6-0T	2	16	20	Slide	Allan ...	3-bar	3 8	5 0	—	6 0	4 9	16,320	V	165	Built-up	4 6½	Uncol.		11
"14xx" ...	0-4-2T	2	16	24	Slide	Stephenson	3-bar	5 2	7 4	—	—	5 11	13,900	S	165	Drumhead	4 6½	Uncol.		95[6]
"15xx" ...	0-6-0T	2	17½	24	PV 8 in.	Walschaerts	1-bar	6 4	7 4	—	6 6	7 11	22,515	K	200	Drumhead	4 9½	Red	C	10

[1] Twenty engines have additional weight at leading buffer beam and are route classification "Red." [2] Twenty-seven carry "D" boilers, route classification "Red," and there are some variations of wheel dia.; "61xx" series have working pressure 225 lb. per sq. in. and all "B" boilers have for some years been constructed for this pressure. [3] Includes 54 of 2-8-2 wheel arrangement. These are identical engines except for bolted-on trailing frame extensions, radial wheels, and increased coal and water capacity. [4] Fitted with regulator gear and A.T.C. A number became redundant for coal traffic in Welsh Valleys during the slump period and were thus altered to be usable on main-line freight trains. [5] "14xx" series fitted with regulator gear and A.T.C. for working push-and-pull trains. [6] "64xx" series with regulator gear and A.T.C. for push-and-pull trains; "74xx" series not so fitted, working pressure 180 lb., T.E., 18,010. "58xx" series not fitted

The "51xx" class 2–6–2 tank locomotive, a type developed, with detail modifications, since 1903

In the two-cylinder large-engine range, excluding the "45xx" class, many components are common throughout, including crossheads, axleboxes (except trailing on 2-8-0 and 2-8-2 classes), pony trucks, and brake cylinders, while many other items are common to a number of classes. The valve gear is completely manufactured by the use of jigs, the only marking out being a preliminary check-marking of the twin eccentric sheave castings.

Throughout the small engine classes there is a great degree of standardisation. The "57xx," "94xx," and the six-coupled tender engine "22xx" class are virtually the same engine, the last named differing mainly in wheel diameter and class of boiler as compared with "57xx," but this is uniform with the "94xx" group. The three-bar motion engines are in two main groups, the "56xx" being a larger engine, but all the remainder of both the four- and six-coupled tank engines have the same motion and valve gear.

Four classes call for special comment. The "94xx" class 0-6-0 tank is basically the "57xx," but carrying the "K" class boiler of larger capacity. Cylinders are similar, other than the incorporation of a cast saddle, and the pannier tanks are shaped to suit the coned boiler, but practically all the other parts are the same. The "57xx" class proper of 863 engines forms the numerically strongest in Britain and with the addition of the 210 "94xx" either completed or on order will form a class of nearly 1,100 engines. Eleven of the "57xx" have enlarged tanks and are fitted with condensing gear and Weir feed pumps for working along the northern part of the Metropolitan Inner Circle to Smithfield Goods Depot.

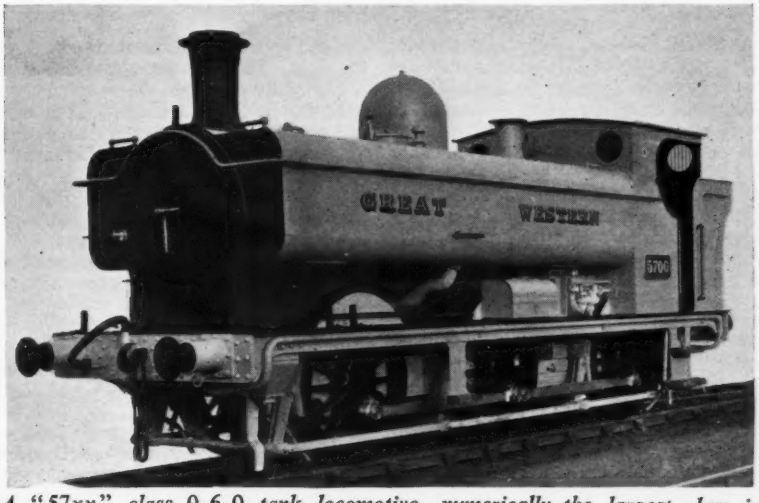
The "1366" class forms a compact group of eleven engines intended primarily for dock working on the old G.W.R. system, and one of their duties involves the Channel Island boat expresses over the Weymouth Quay line. It was a perpetuation of an earlier group and has Allan link gear.

The "15xx" class of locomotives perhaps appears to be in strange surroundings. It was designed by Hawksworth, using a number of standard components, with the particular objective of providing a 24-hour yard shunting engine which can be completely oiled without access to a pit.

The class which is composed of the lowest number of engines, namely, the 2-8-0 mixed-traffic engine (incidentally the last of Churchward's own engines) was designed for working heavy fast vacuum-fitted freight trains. Later, it was decided not to increase the class, but

TABLE 2.—BOILERS

Class	Firebox			Barrel			Grate area	Heating surface	Dia. of tubes		Working pressure
	Length	Width at top		Length	Diameter						
		Front	Back		Front	Back			Super flue	Fire	
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.			in.	in.	
"A"	9 0	5 9	4 9	14 10	4 10½	5 6	27·07	2,104	5½	2	225
"B"	7 0	5 3	4 9	11 0	4 5⅛	5 0½	20·35	1,349	5½	1⅝	225
"D"	7 0	5 9	4 9	11 0	4 10½	5 6	20·56	1,670	5½	1⅝	200
"E"	5 10	5 0	4 6	10 6	4 2	4 9½	16·6	1,160	5½	1⅝	200
"F"	5 6	4 ft. 5⅛ in.		10 6	4 2	4 3	16·76	1,086	5½	1⅝	180
"G"	10 0	6 3	5 0	14 10	5 6 1/16	6 0	30·28	2,519	5½	2	225
"H"	10 0	6 0	4 9	14 10	5 1⅛	5 9	29·36	2,283	5½	2	225
"K"	6 0	5 3	4 9	10 3	4 5⅛	5 0½	17·4	1,245	5½	1⅝	200
"O"	9 8	5 10⅞	5 2⅝	12 7 7/16	5 0	5 8⅛	28·84	1,962	5½	1¾	280
"P"	5 4	4 ft. 7⅜ in.		10 3	4 3⅞	4 5	15·3	1,115	—	1⅝	200
"Q"	5 0	4 ft. 5½ in.		10 1	3 9½	3 10	14·9	956	—	1⅝	165
"S"	4 6	4 ft. 5½ in.		10 0	3 9½	3 10	12·8	953	—	1⅝	165
"V"	3 11	4 ft. 5⅛ in.		8 2	3 ft. 10 in.		10·7	788	—	1⅝	165
"W"	11 6	6 3	5 0	16 0	5 6½	6 0	34·3	2,490	5½	2¼	250
"Z"	7 6	5 5½	4 9	12 6	4 7⅞	5 3	22·1	1,585	5½	2	225



A "57xx" class 0–6–0 tank locomotive, numerically the largest class in Britain, differing only slightly from other classes with the same wheel arrangement

to concentrate on "Castles" which, with a slightly higher tractive effort, can handle the vacuum freights and also are better suited for passenger duplications during traffic peaks.

Boiler Standardisation Details

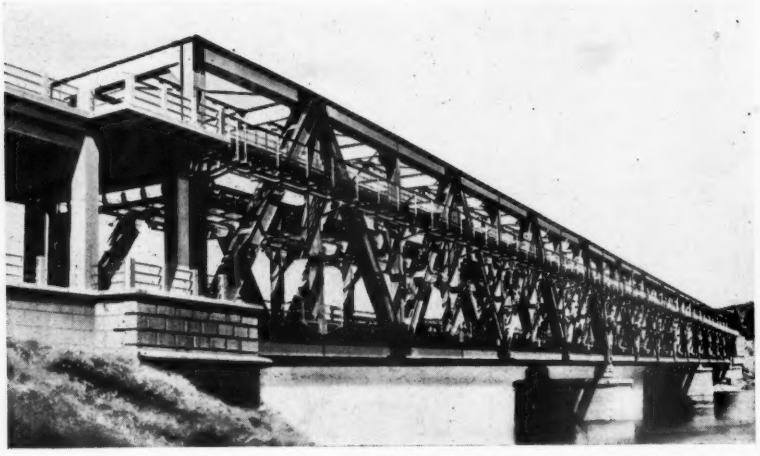
Standardisation as applied to boilers is shown in Table 2, from which it will be seen that 15 classes cover 3,318 engines. Here, again, standardisation of many details takes place between classes: for example, Classes "A" and "D" use the same flanged plates, which therefore cover over 1,000 boilers, and, similarly, "B" and "K," 677 boilers, and "F," "Q," and "S," 260 boilers. Water gauges are common to all boilers, and injector steam cocks, steam fountains, blower valves common to many classes.

Some boiler classes were known by class numbers such as Standard No. 1, No. 2, and so on, but later all classes were brought into a series of two-letter prefixes, and of these the first of the two letters has been quoted in the tables. Standard No. 1 became "A" class and No. 2 "B" class. Some gaps, which were refilled later, occurred in the numeral designations, and therefore ultimately the letters and numerals did not remain in the same sequence. The second letter of the prefix indicates minor modifications, such as degree of superheat, top feed, and position of carrying brackets, which do not affect the boiler class.

Western Region locomotive stock may in this article be taken as 3,776, of which 3,318 have been accounted for in the development under review. The completion of the "94xx" class on order will raise this to 3,413. Of the remainder, 86 have come into Western Region stock by the absorption of war stores (2-8-0 engines) and 31 are new British Railways standard designs, gas turbine, diesel-electric, or narrow-gauge engines. The remainder, with the exception of a small number for special locations such as some acquired dock areas, would in the near future have been replaced by an extension of the standard classes, and would have been capable of meeting Great Western locomotive needs, as far as can be foreseen at present, for some years to come.

New Rail-Road Bridge at Sesto Calende, Italy

Rebuilding of structure carrying international rail and road routes over River Ticino



New bridge at Sesto Calende, with railway laid on lower deck and upper deck, to carry road, awaiting completion

A SHORT distance below its effluence from Lake Maggiore and just south of Sesto Calende, the River Ticino is spanned by an important rail-cum-road bridge. Over it passes traffic carried by (*a*) the Domodossola-Milan section of the Simplon line, (*b*) the Luino-Novara line—some of it goods traffic from eastern Switzerland to Genoa and Turin *via* Alessandria, and (*c*) the Simplon route trunk road No. 33; (*a*) and (*b*) intersect at this point.

The original road-rail bridge, constructed in 1882, had three continuous through-type lattice-girder spans, 270 ft., 325 ft., and 270 ft. in length; on its lower deck were laid two railway tracks, and the roadway ran above them on an upper deck. So important a traffic intersection and bridge naturally became a military target in the last war, and during 1944-45 the superstructure was almost completely destroyed, largely by bombing, as also was the approach on the Arona bank of the river. The piers and abutments were only slightly damaged.

To restore the flow of traffic as quickly as possible, a temporary single-line trestle and steel-girder bridge was thrown across the river upstream of the wrecked structure by November, 1945, but the permanent bridge had only comparatively recently been reconstructed. The old piers and abutments were repaired and strengthened to support a new superstructure of the same general continuous design and lengths of spans as in the old bridge. The approaches, however, have been reconstructed to suit the modified levels of the railway and road bridge.

The new main girders are through Warren trusses with verticals and square ends, and are about 45 ft. deep. Their bottom chords carry the cross-girders supporting the two-track railway deck, and the 23-ft. wide reinforced concrete road decking rests on another series of cross girders about two-thirds of the way up the main-girder vertical members. A 6 ft. 6 in. footway is cantilevered out on each side of the main girders at roadway level.

The superstructure was fabricated in medium-hard or 18 kg. per sq. mm. steel, but high-tensile steel rivets were used, resulting in a considerable reduction in the sizes of the gusset plates. It is designed to carry the 1945 Standard A rail loading with impact for speeds up to 90 m.p.h., and also the 1945 Standard Public Works Department Class 1 road loading. Including the cast-steel pedestal bearings, the aggregate weight of steelwork involved in the reconstruction was 3,640 tons, and the total cost of the work was 1,140 million lire (about £1,250,000).

FENCING OF HYDRAULIC PRESSES.—Methods for safeguarding heavy presses are dealt with in a report of the Joint Standing Committee on Safety in the Use of Power Presses, which has been submitted to the Chief Inspector of Factories and was published on May 30. The report of the subcommittee, which has been adopted by the Joint Standing Committee with few amendments, proposes two forms of guard as appropriate—the sliding screen guard and the photo-electric safety device. It is considered that sliding screen guards effectively controlling the electrical equipment afford an effective physical protection, and that there is an appropriate field for a safety device on the photo-electric principle. The report also contains recommendations to be observed in connection with the electrical equipment of these machines, and stresses the need for effective inspection and maintenance of the safety device and those parts of the machines which affect safe working. Copies of the report are obtainable from Her Majesty's Stationery Office, or through any bookseller, price 1s. net.

RAILWAY NEWS SECTION

PERSONAL

Mr. B. B. Varma has retired from the position of General Manager of the East Indian Railway.

Mr. Victor Michael Barrington-Ward, C.B.E., D.S.O., M.Inst.T., Commander Order of St. John, Member of the Railway Executive, Colonel Railway Staff Corps, R.E., who, as recorded in our June 6 issue, receives the K.C.V.O. in the Queen's Birthday Honours List, was educated at Westminster and at Edinburgh University, where he took his engineering degree. He joined the Midland Railway in 1907 and became an Assistant Engineer on the staff of the Engineer-in-Chief. Whilst in that post he was awarded the Miller Prize of the Institution of Civil Engineers. In 1914 he was appointed an Assistant to the General Superintendent. At the outbreak of war he was Captain, South Lancashire Regiment, but was transferred and promoted Major on the headquarters staff of the Railway Operating Division, R.E., on its formation in 1915. Mr. Barrington-Ward subsequently became Lt.-Colonel in command of a large group of operating companies; he was awarded the D.S.O. for gallantry, was mentioned in dispatches four times, received the French Croix de Guerre, with palm, was cited in French Army Orders and finally was awarded a Brevet Lt.-Colonelcy. In March, 1919, he was appointed Director Railway Operations, Ministry of Transport. In 1922, he joined the General Manager's staff of the North Eastern Railway and in January, 1923, became District Superintendent, Middlesbrough. In 1927 he was appointed Superintendent, Western Section, Southern Area of the L.N.E.R., becoming Superintendent of the whole of the Southern Area in 1939. Mr. Barrington-Ward was appointed Assistant General Manager, Operating, in 1942. From 1938 to 1945 he was Chairman of the Railway Executive Committee Operating Committee. He holds the Medal of Freedom with Silver Palm (U.S.A.). He was appointed Divisional General Manager (Southern Area) (L.N.E.R.) in 1945, and in 1947 became a full-time Member of the Railway Executive. From 1924 to 1928 Mr. Barrington-Ward was largely instrumental in organising and raising the transportation troops of the Royal Engineers Supplementary Reserve and was Lt.-Colonel commanding the Operating Group, Royal Engineers. In 1938 he was awarded the Operations Gold Medal of the Institute of Transport for a paper on " Railway Operation " read before that Institute, of which he was Vice-President from 1945 to 1948.

We regret to record the death on May 18, at the age of 60, of Mr. E. H. Huckle, Assistant (Salaried Staff), Regional Staff Office, Eastern Region, Liverpool Street. Cremation took place at Golders Green on May 22. A portrait and biography of Mr. Huckle appeared in our December 14, 1951, issue.

Mr. F. Hall has been appointed a Special Director of the Superheater Co. Ltd.

Dr. G. E. Foxwell has consented to continue to serve as President of the Institute of Fuel for a second term.

Mr. John Cumberland Landale Train, M.C., M.I.C.E., Member of the Railway Executive since 1947, Member of Council, Institution of Civil Engineers, Immediate-Past President, Permanent Way Institution, who, as recorded in our June 6 issue, receives the C.B.E. in the Queen's Birthday Honours List, joined the North British Railway, Edinburgh, as an apprentice in 1908, and became Junior Engineering Assistant, G.N.R., in 1912. He enlisted in the Infantry in August, 1914, was awarded the M.C. in 1918 whilst in command of the R.E. Field Company and was demobilised in June, 1919, with the rank of Major. Mr. Train was appointed Personal Assistant to the Chief Engineer, G.N.R., in 1921; Assistant to Sir Ralph Wedgwood in 1926; District Engineer, Glasgow, in 1929; Assistant Engineer (Maintenance), L.N.E.R. (Southern Area), in 1934; Engineer (Scotland), L.N.E.R., in 1938; Engineer (Southern Area), L.N.E.R., in 1941; and Chief Engineer, L.N.E.R., in 1942. He served on the Railway (London Plan) Committee between 1946-47. Since nationalisation, Mr. Train has carried out many inspections on all Regions of British Railways, covering over 15,000 route-miles.

Photo] [*Bassano*

Mr. V. M. Barrington-Ward

Member, Railway Executive, who receives the K.C.V.O.

Photo] [*Lafayette*

Mr. J. C. L. Train

Member, Railway Executive, who receives the C.B.E.

Mr. Edward George Marsden, M.B.E., Secretary, Railway Executive, who receives the O.B.E. in the Queen's Birthday Honours List, joined the North Eastern Railway in 1921. After wide experience in the Commercial and Operating Departments of the North Eastern and Scottish Areas of the L.N.E.R., he was appointed in 1932 to the staff of the Passenger Manager, York, where, at the instance of Sir Ralph Wedgwood, he undertook certain inquiries into road transport questions. In the same year he went to London for special work at headquarters and with the Railway Companies' Association arising from the Salter Conference. Later his services were again lent to the Railway Companies' Association in connection with matters leading to, and occasioned by, legislation affecting road and rail transport. Mr. Marsden was a member of the Standing Joint Committee of Railway Air Services Limited from 1934 until December, 1937. His association with the Railway Executive Committee dated from September, 1938, when the L.N.E.R. released him from service with the committee on its formation as an advisory body. After the R.E.C. had been formally appointed on September 1, 1939, Mr. Marsden acted as Principal Assistant to the Secretary, until himself appointed Secretary in April, 1945. He became Secretary of the Railway Executive on nationalisation in 1948.

Mr. E. G. Marsden

Secretary, Railway Executive, who receives the O.B.E.

The late Mr. G. S. Bellamy

Mechanical & Electrical Engineer, Scottish Region, British Railways, 1948-52

Lord Cunliffe, who, as recorded in our May 30 issue, has been appointed to the board of Brush Electrical Engineering Co. Ltd. (the parent of the Brush Aboe group), has resigned as a Director and Chairman of the National Gas & Oil Engine Co. Ltd., of which A. P. Good now becomes Chairman. Mr. A. E. Carrodus has also resigned from the board of National Gas & Oil Engine Co. Ltd. and Mr. Miles Beevor has joined the board.

Mr. J. T. Drinkwater, Assistant (Revenue Matters) to the Chief Financial Officer, Railway Executive, who retired on May 31, recently was the recipient of a presentation by Mr. H. Adams Clarke, Chief Officer (Staff & Establishment), on behalf of senior officers of the Railway Executive. The presentation was a tea and dinner service of Wedgwood china, together with an album containing the signatures of the subscribers.

Mr. A. J. Fyfe, General Agent for Scotland, Canadian Pacific Railway, has retired and has been succeeded by Mr. Thomas Craig.

Mr. Arnold Watson, General Manager of Castrol sales for the last four years, has been elected to the board of C. C. Wakefield & Co. Ltd.

Mr. Benjamin R. Temple, Development Assistant to Commercial Superintendent, Scottish Region, has been appointed District Commercial Superintendent, Dundee.

Dr. Paul D. Merica, formerly Executive Vice-President, has been elected President of the International Nickel Company of Canada Limited, and Dr. John F. Thompson, who has retired as President, continues as Chairman & Chief Officer.

Mr. G. S. Bellamy, M.I.Loco.E., Mechanical & Electrical Engineer, Scottish Region, whose death on May 31, we recorded briefly in our June 6 issue, joined the Midland Railway as an engineering apprentice at Derby in 1910, and served in France with the Royal Engineers during the first world war and was mentioned in despatches. In 1919 he returned to Derby as Works Inspector and in the following year was appointed Resident Inspector of locomotives being built at Newcastle-on-Tyne for the Midland Railway. Two years later, in 1922, he became Mechanical Inspector in the Department of the General Superintendent and in 1923 he was appointed Freight Trains Assistant of the Midland Division, L.M.S.R. He became Assistant Superintendent of Motive Power, Midland Division, in 1925, and Assistant to the Superintendent of Motive Power for the L.M.S.R. in 1926; in 1928 he was promoted to be Assistant Superintendent of Motive Power, Chief General Superintendent's Department, and in 1932 was appointed Works Superintendent (Locomotives), Derby. Mr. Bellamy was Commanding Officer of the 155th Railway Workshops Company of the Royal Engineers (S.R.), and in 1939 was mobilised with the rank of Lt.-Colonel, Royal Engineers. He served in France and after the fall of that country returned to Britain with the distinction of again having been mentioned in despatches. In 1940 he resumed his former position of Works Superintendent at Derby and in 1941 received the appointment of Mechanical & Electrical Engineer (Scotland), L.M.S.R. On January 1, 1948, he became Mechanical

& Electrical Engineer of the Scottish Region, British Railways. The funeral service took place on June 3, in St. Mary's Episcopal Church, Bridge of Weir, the Rev. Canon W. S. Robinson officiating; interment was in Kilbarchan Cemetery, Renfrewshire. In addition to family mourners, those present included:—

Scottish Region: Messrs. T. F. Cameron, Chief Regional Officer; A. Stewart, Assistant to Chief Regional Officer, also representing Mr. T. H. Moffat, Deputy Chief Regional Officer; J. G. Dunlop, Accountant; C. H. Brazier, Regional Staff Officer; T. H. Hollingsworth, Commercial Superintendent; J. McCreadie, Operating Superintendent; W. Dunsmuir, representing Mr. E. D. Trask, Motive Power Superintendent; L. E. Marr, Manager, Clyde Shipping Services; Captain H. J. Perry, Marine Superintendent; Messrs. M. G. Maycock, representing Mr. I. R. Frazer, Civil Engineer; J. Blair, Carriage & Wagon Engineer; W. L. Turner, Road Motor Engineer; G. R Dalgleish, representing Mr. C. R. Atkins, Stores Officer; E. C. Dewick, Estate & Rating Surveyor; H. M. Hunter, Public Relations & Publicity Officer; J. Hastie, Treasurer; Dr. T. Sharp, Medical Officer; Messrs. G. Thomson, Assistant Mechanical & Electrical Engineer (Outdoor, Machinery & Electrical); W. Paterson, District Engineer (Glasgow South).

Also among those present were: Messrs. T. F. B. Simpson, Works Superintendent (Locomotive), Derby, London Midland Region; R. P. Critchley, representing Institution of Locomotive Engineers; J. E. Bagguley and C. W. Handcock, representing North British Locomotive Co. Ltd.; R. C. Bond, Chief Officer (Locomotive Construction & Maintenance), Railway Executive, also representing Mr. R. A. Riddles, Member, Railway Executive; Lt.-Colonel H. Rudgard, former Chief Officer (Motive Power), Railway Executive, also representing Mr. J. W. Watkins, Chief Regional Officer, London Midland Region; Major M. S. Spier, Chief Officer for Scotland, L.M.S.R. (retired); Messrs. W. Y. Sandeman, Civil Engineer, Scottish Region (retired); A. H. McMurdo, Civil Engineer, L.M.S.R., Northern Division (retired); E. A. Milne, Carriage & Wagon Engineer, Scottish Region (retired); J. G. Barr, Locomotive Superintendent, L.M.S.R., Northern Division (retired); D. Galbraith, Staff Assistant, Chief Officer for Scotland, L.M.S.R., Northern Division (retired)

Dr. F. W. Carter, M.A., Sc.D., F.R.S., M.I.C.E., M.I.E.E., whose death we recorded briefly in our June 6 issue, was, before his retirement in December, 1946, for many years Consulting Engineer with the British Thomson-Houston Co. Ltd. He was born at Aston, Birmingham, in 1870, and educated at the Albert Road School, the Birmingham & Midland Institute, and St. John's College, Cambridge. He was appointed Assistant Lecturer at the Central Technical College (City & Guilds of London Institute) in 1896 and remained there until 1900, when he joined the General Electric Company, U.S.A. On his return to England in 1903, Dr. Carter joined the design engineering staff of the British Thomson-Houston Co. Ltd., after being appointed Consulting Engineer. He was elected Fellow of the Royal Society in 1932. Dr. Carter was well known as the author of many technical works. In addition to a book on "Railway Electric Traction," he contributed many papers to science and engineering on such subjects as "Magnetic Fields in Air Gaps of Dynamo Electric Machines," "Air Gap Coefficients," "Design of Transformers," "The Repulsion Motor," "Electric Railway Engineering," and "Stability of Running of Locomotives." The funeral service took place at Canley Crematorium on June 3.

The Queen's Birthday Honours List

The following is a selection, further to that published in our last week's issue, of honours of transport and industrial interest from the Queen's Birthday List:—

Knight Bachelor

The Honourable Herbert John Thornhill Hyland, Minister of Transport, Prices and State Development, State of Victoria.

C.B.

Mr. Patrick James Edward Dalmahoy, Under-Secretary, Ministry of Transport.

C.B.E.

Mr. Robert Porter Corry Gotto, O.B.E., D.L. For public services in Belfast. He is a Member of the Ulster Transport Authority.

Mr. Walter Allen Scott Lewis, O.B.E., lately Provincial Transport Commissioner, East Bengal.

Mr. Thomas Francis Rice, General Manager, Government Produce Department, and Chairman, Supply & Tender Board, State of Victoria.

Mr. William Savage, Works Director & Chief Engineer, Ruston Bucyrus Limited.

Mr. Donald Thomas Alfred Townend, Director-General, British Coal Utilisation Research Association.

O.B.E.

Mr. Richard Owen Banister, Divisional Operating Superintendent, Manchester, London Midland Region, British Railways.

Mr. Walter Burrows, Chief Executive Officer, Ministry of Transport.

Mr. Kenneth Richard Evans, Manager, Education Department, Metropolitan-Vickers Electrical Co. Ltd.

Mr. William Ewart Hocking, M.B.E., Principal, Ministry of Transport.

Mr. Alfred Charles Henry Illston, Deputy Chief Engineer, Mechanical Engineering Department Office of the Crown Agents for the Colonies.

Mr. Stanley Merry Johnson, M.C., lately Deputy Chief Engineer (Bridges), North Western Railway, Pakistan.

Mr. Edward George Marsden, M.B.E., Secretary, Railway Executive.

Mr. George Noble, J.P., Manager of Fawley Refinery, Esso Petroleum Company.

Mr. Francis Lawrence Shepherd, Special Director, Dorman Long & Co. Ltd.

Mr. Ross Lewis Stubbs, Secretary, British Non-Ferrous Smelters Association.

M.B.E.

Mr. Reginald Baker, Higher Executive Officer, Engineering Stores Department, Office of the Crown Agents for the Colonies.

Mr. Arthur Leslie Baxby, Assistant Locomotive Superintendent, Malayan Railway.

Mr. Philip Chapman Butler, Higher Executive Officer, Eastern Traffic Area, Ministry of Transport.

Mr. Owen Peel Calmady Collier, Grade II official acting as General Manager of the Eritrea Railway.

Mr. Charles Corps, District Commercial Superintendent, Middlesbrough, North Eastern Region, British Railways.

Mr. Nicholas Chua Kim Duan, Senior Permanent Way Inspector, North Borneo Railways.

Mr. Albert Flint, lately Office Manager, Brown Bayley Steels Limited, Sheffield.

Mr. John Henry Freeman, J.P., lately Manager, Coryton Oil Installation, Vacuum Oil Company.

Mr. William Oswald Gittins, Higher Executive Officer, West Midland Traffic Area, Ministry of Transport.

Mr. James William Green, Chief Inspector, Mexborough & Swinton Traction Company.

Mr. Terence Edward Huey Gwyer, General Works Manager, Trico-Folberth Limited.

Mr. Eleazer Halder, Dock Superintendent, Middlesbrough Dock, Docks & Inland Waterways Executive.

Mr. Frederick George Carrington Howard, Assistant (General) to the Chief Regional Officer, London Midland Region, British Railways.

Mr. Reginald Fredrick Humphrey, Area Engineer, Portsmouth, Southdown Motor Services.

Mr. William Charles Ikeson, Technical Assistant to the Chief Mechanical Engineer, Iraqi State Railways.

Mr. Allan Carlton Kain, Engineer, Metropolitan Division, Ministry of Transport.

Mr. Alexander William Innes Mavor, Secretary, Scottish Omnibuses Limited, Edinburgh.

Miss Florence Kate Melville, Clerical Officer, Ministry of Transport.

Mr. Leslie Albert Morgan, Assistant to District Operating Superintendent, Cardiff, Western Region, British Railways.

Mr. Stanley Howe Morris, Inspecting Engineer, Office of the Crown Agents for the Colonies.

Mr. Sidney Maurice Sewell, Docks Manager, King's Lynn, Docks & Inland Waterways Executive.

Mr. Hugh Fraser Smart, District Operating Superintendent, Burntisland, Scottish Region, British Railways.

Mr. James Stockwell, Works Director, Switchgear & Cowans Limited, Manchester.

Mr. Reginald Wallace Thom, lately Divisional Mechanical Engineer, State Railways, Pakistan.

Mr. William Wilfred Vaughan Williams, Traffic Assistant, Bristol Tramways & Carriage Co. Ltd.

Companion, Imperial Service Order

Mr. Percival Francis Cherry, Secretary to the Railways Commissioner, State of South Australia.

Mr. Ralph Gordon Terry, Manager, Supply & Tender Department, State of Tasmania.

Mr. W. E. Hancox, Outdoor Assistant to the Signal & Telecommunications Engineer, Southern Region, has accepted an invitation to become Chairman of British Railways, Southern Region, Lecture & Debating Society, in succession to Mr. N. L. Collins, who, as recorded in our May 16 issue, relinquished this post on taking up the appointment of District Traffic Superintendent, Exeter.

Mr. Colin A. Mackersey, has retired as Electrical Engineer for Power Supply Installations, New Zealand Government Railways. He joined the railway service as a draughtsman in 1924 and later became First Assistant Engineer (Electrical). During the recent war he served three years in the Middle East, and resumed duty with the Railway Department in 1944. He became Electrical Engineer for Power Supply Installations in 1945 and during his term of office, has been associated with a number of major works, including the Hutt Valley project now under construction.

British Transport Commission Statistics (Period No. 4)

Summary of the principal statistics for the four-week period ending April 20

STAFF

—	B.T.C. Head Office	British Railways	London Transport	British Road Services (Road Haulage)	Road Passenger (Provincial & Scottish)	Hotels & Catering	Ships & Marine	Inland Waterways	Docks, Harbours, Wharves	Railway Clearing House	Common Services: Commercial Advertisement	Legal	Films	Total
Number ...	284	606,915	99,187	77,662	60,926	16,082	6,040	4,863	20,950	623	198	315	41	894,086
Inc. or dec.	+1	+1,769	−54	−541	+430	+357	+70	+8	+100	−4	+1	−3	+1	+2,135

BRITISH TRANSPORT COMMISSION TRAFFIC RECEIPTS

—	Four weeks (Period No. 4)		Aggregate for 16 weeks	
	1952	1951	1952	1951
	£000	£000	£000	£000
British Railways—				
Passengers	8,772	6,827	28,017	25,763
Parcels, etc., by passenger train	2,683	2,443	10,434	9,519
Merchandise	7,665	7,388	32,930	28,682
Minerals	3,067	2,680	13,000	10,517
Coal & coke	7,669	6,851	32,264	27,002
Livestock	108	94	443	323
	29,964	26,293	117,088	101,806
British Railways— C. & D. and other road services	854	797	3,520	3,041
Ships and Vessels	718	699	2,469	2,446
London Transport—				
Railways	1,409	1,232	5,232	4,857
Buses & coaches	2,991	2,505	10,885	9,520
Trams & trolleybuses	773	762	2,847	2,972
	5,173	4,499	18,964	17,349
British Road Services— Freight charges, etc.	5,766	5,882	23,733	22,554
Road Passenger Transport	3,347	3,014	12,223	11,111
Docks, Harbours & Wharves ...	1,142	1,019	4,633	3,751
Inland Waterways	163	150	687	548
Hotels & Catering	1,221	1,200	4,558	4,391
Total	48,348	43,543	187,915	166,997

LONDON TRANSPORT

—	Passenger journeys	Inc. or dec. per cent. over 1951	Car miles	Inc. or dec. per cent. over 1951
	000		000	
Railways...	43,637	− 9·6	16,759	− 3·8
Buses & coaches	214,896	− 1·4	26,135	+ 4·2
Trams & trolleybuses	61,933	−18·5	6,374	−16·8
Total	320,466	− 6·4	49,268	− 1·8

INLAND WATERWAYS

Tonnage of traffic and ton miles

—	Tonnage	Inc. or dec. per cent. over 1951	Ton miles	Inc. or dec. per cent. over 1951
	000		000	
Coal, coke, patent fuel & peat	468	+ 6·7	6,855	+ 9·1
Liquids in bulk	147	−11·2	3,258	−17·5
General merchandise ...	339	+ 2·2	4,540	−11·4
Total	954	+ 1·9	14,680	− 4·6

BRITISH RAILWAYS

Rolling Stock Position

—	Operating stock	Number under repair	Available operating stock	Serviceable stock in 1951
Locomotives	18,855	3,076	15,779	15,573
Coaching vehicles	57,804	5,564	52,240	52,200
Freight wagons...	1,106,964	75,364	1,031,600	1,035,496

BRITISH RAILWAYS

Passenger Journeys (Month of March, 1952)

Full fares	Monthly returns	Excursions, cheap day, etc.	Other descriptions	Workmen	Season tickets	Total	Inc. or dec. per cent. over 1951
7,122,000	5,213,000	19,741,000	3,836,000	18,450,000	24,342,000	78,704,000	+ 3·4

BRITISH RAILWAYS

Freight Tonnage Originating and Estimated Ton-Miles (Period No. 4)

—	Minerals	Merchandise	Coal & coke	Livestock	Total	Inc. or dec. per cent. over 1951
	000	000	000	000	000	
Tons originating ...	4,548	3,779	12,772	60	21,159	− 3·7
Ton-miles	385,774	519,788*	775,943	—	1,681,505	− 4·6

* Includes livestock

BRITISH RAILWAYS (Period No. 4)

—	Total steam coaching train-miles	Total electric coaching train-miles	Total freight train-miles	Freight train-miles per train engine-hour	Net ton-miles per total engine-hour	Locomotive coal consumption	
						Total tons	Lb. per engine-mile
1952	13,614,000	3,671,000	10,457,000	8·7	617	1,009,000	63·7
1951	13,941,000	3,669,000	10,874,000	8·3	600	1,063,000	64·6

Institution of Railway Signal Engineers

Visit to French National Railways signalling installations in Paris area

The summer meeting of the Institution of Railway Signal Engineers was held in Paris, at the invitation of Monsieur Louis Armand, General Manager of the French National Railways. The party, consisting of nearly 100 members and ladies, left London on May 22 and was led by the President, Mr. T. S. Lascelles, supported by Mr. T. Austin, Senior Vice-President, Mr. R. Dell, Past President, Messrs. J. C. Kubale, D. G. Shipp, F. G. Hathaway, and M. Le Sueur, Members of Council, Mr. G. J. Dickin, Hon. General Secretary, Mr. B. Reynolds, Hon. Treasurer, and Mr. W. H. Challis, Hon. Secretary, General Purposes Committee, responsible for the arrangements.

On May 23, members were welcomed at Paris Nord by Messieurs J. G. Walter, Chief Signal Engineer, Demaux, Civil Engineer, and Martin, Signal Engineer, Northern Region, and inspected No. 11 Box, containing a mechanical frame of the design now standard for installations up to about 60 levers.

Certain functions, however, can be operated, if desired, electrically by small levers, mounted in the same row in place of full size ones. The interlocking is of the long well-known "gridiron" type, originally produced by Saxby & Farmer, with fittings enabling electric locking to be applied for various purposes. Signals are of the mechanical disc pattern, seen generally in France, but actuated by electric signal machines. The box controls an important group of carriage sidings, but no running movements.

The party proceeded to Bobigny, to inspect an electro-mechanical signal box controlling a connection between the Grande Ceinture lines and those of the Eastern Region, also sidings and a depot. In this arrangement, used for signal boxes of over 60 levers, when a full power installation is not warranted, there is a row of miniature levers at half-centres, placed over the ordinary full-size ones allocated to the operation of points. All signals are electrically worked and are generally colour lights. Track circuit control is provided and the mechanical locking is of the Stevens type.

Enclosed Facing Point Lock

The visitors were specially interested in the new type of enclosed facing point lock, which secures the closed tongue directly to the stock rail; its working was fully explained, with that of a special rail-contact and a cab signalling ramp of the "anti-frost" pattern. Concrete apparatus cases also were on view.

At Gagny, a new all-relay power interlocking was inspected; this controls a triangular set of junctions connecting the Ceinture and Strasbourg lines. The box formerly contained an individual lever electric power frame now replaced by a remarkably small control panel. The presetting of routes was demonstrated as trains passed.

A further development of this system was then inspected near Bry-sur-Marne, where a single-line connection joins the Ceinture and Belfort lines, for which a box had to be kept manned. This has been replaced by an apparatus room remotely controlled from Bry Station, where there is now a panel.

On their return to Paris, the visitors were entertained to lunch by the French National Railways; Monsieur Demaux presided. Welcoming the members of the Institution he referred to the importance of the work of signal engineers, with which he had himself been at one time associated, and the great pleasure felt at the desire shown by the Institution to see the latest French signalling developments.

Mr. Lascelles, replying, spoke of the earlier visit paid in 1927 to the former Northern Railway, when the work of French signal engineers was beginning to be better appreciated in England and the Institution was contributing to that result. Today the same capabilities were in evidence in the excellent installations they had visited, with the same progressive spirit, seeking always after further improvement. The Council of the Institution was most grateful for the facilities so generously extended.

After lunch the large No. 1 route-lever signal box at the Gare du Nord was inspected. As traffic was then heavy, the working proved most interesting, the route-levers being actuated every few moments. Although this type of apparatus is being given up in favour of all-relay equipment, it continues to render excellent service.

Ball Type Point Control

On May 24, a visit was paid to Villeneuve yard, the most important in France, to see marshalling by means of the ball type automatic point control machine. The inventor, Monsieur Robert Lévi, Head of the Fixed Equipment Department of the French National Railways, was present, with Monsieur Boillot-Batault, Signal Engineer, South Eastern Region. The running of the wagons is controlled by air-operated rail brakes, and the points are worked by special rapid-acting machines, of the electric pattern, which throw the switches in less than half a second. Several trains were sorted while the apparatus was demonstrated, and some of the party rode on the diesel shunting engine to inspect the operation of the wireless communication between it and the hump cabin.

Institution Luncheon

The official luncheon was held afterwards in Paris, with Mr. Lascelles presiding, and Monsieur Walter representing Monsieur Armand, who was unable to attend.

Mr. Lascelles expressed the great pleasure he felt at leading the party and meeting again so old a friend as Monsieur Walter, well known to many signal engineers in Britain.

Relations with Signal Engineers Overseas

The Institution, said Mr. Lascelles, was now some 40 years old. It was not a large body, but had contributed considerably to the development of contacts between signal engineers in various countries and the interchange of information on a vital element in successful railway operation. He congratulated the French signalling industry on the excellence of its products. They hoped to see other French engineers join the Institution; Monsieur Walter was a member, and the late Raoul Dautry had been.

Continuing, Mr. Lascelles spoke of his own close associations with many French engineers and concluded by thanking all those who had done so much to welcome the Institution to Paris. He then presented to Monsieur Walter the prize awarded to him by the Council for the best paper read before the Institution in 1951; this took the form of a teapot.

Monsieur Walter referred to his long association with British engineers and appreciation of their work in the field of signalling. The French railways felt honoured at receiving the Institution in Paris, and he hoped that all concerned had enjoyed the visit. The prize he had received would serve always to remind him of the occasion.

Mr. Austin expressed the thanks of the party to the Institution's officers and to Mr. Challis for organising the visit so efficiently.

Mr. Challis said in reply that everyone had co-operated to reduce the work involved to a minimum.

A visit then was paid to the new remote control panel in the traffic controller's office at the Gare de Lyon, which operates the points and signals at a point about five miles out, and enables the controller to decide by which up line incoming trains approach the terminus.

Sunday was occupied by visits and excursions, and the party returned to London from the Gare du Nord on May 26.

Electrification Extended in the Netherlands

On May 17 electric traction was inaugurated on the Zwolle-Leeuwarden and Meppel-Groningen section of the Netherlands Railways. The whole of the service between the chief cities of the western part of the country and the northern provinces is now worked by eleven streamline motor-coach trains and four electric locomotive-hauled trains, giving 17 connections between Groningen, Leeuwarden and Zwolle, 15 connecting with the west. In addition there is a shuttle service of nine trains between Zwolle and Groningen, raising the number of trains on that section to 26, with 17 between Zwolle and Leeuwarden. There is also a late evening train between Groningen and Assen and one between Leeuwarden and Heerenveen.

Zwolle is the point where trains are divided. As the motor coach trains run west of Zwolle with two four-coach train sets, the Groningen portion is arranged to run several times during the day to and from Rotterdam, in addition to the service to Amsterdam; and the Leeuwarden portion runs similarly to and from The Hague. On special holiday days there will be extra trains over these routes between the west and north. Diesel-electric connections at Zwolle running to Emmen are being provided off the through expresses. Diesel feeder services were already provided between Harlingen and Leeuwarden, and Leeuwarden and Groningen. Steam services between Groningen and Winschoten are being replaced by diesel, enabling more frequent services to be given, and similarly on other sections.

An electrification exhibition was staged in April by the Netherlands Railways at Groningen. The many interesting items included photographs and extracts from old newspapers illustrating the development of the Groningen-Leeuwarden line opened for traffic in 1866, and that of electric traction in the Netherlands generally, with related progress in the layout of stations, and so on. Both full-size and model equipment were shown. The exhibition was combined with an industrial exhibition of

considerable importance, which was visited by leading Ministers, and other authorities concerned with transport and allied matters. The electrification exhibition was moved to Leeuwarden at the beginning of May.

The extension of electrification into the Province of Friesland has given great satisfaction locally. At numerous stations, such as Drenthe, Meppel, and Assen, the event was celebrated by organised festivities in which trade bodies and co-operative societies took part.

Single-Deck Rail Coaches for Blackpool

A demonstration was given recently by Charles Roberts & Co. Ltd. of one of 25 single-deck rail coaches under construction for the County Borough of Blackpool Transport Department. The vehicles will operate on the South Shore to Fleetwood line, which for most of its route is laid on its own reservation. In their mechanical and electrical design and their appointments, the new coaches conform with the status of the line as an interurban railway rather than a tramway in the generally accepted sense.

The metal-framed body and underframe has been built by Charles Roberts & Co.

Single-deck rail coach for Blackpool in the works of Charles Roberts & Co. Ltd.

Ltd. The whole structure is connected together with rails, stout truss panels and diagonal bracing to make a perfectly rigid shell. All main exterior panels are of 16 gauge mild steel sheets, secured by screws to the timber packing of the framing members and decorative polished stainless steel mouldings cover the joints.

Inside the car the ceiling and bulkhead panels of the saloons are finished in Alhambrinal. Main pillars are treated in cream Rexine and finished in walnut polished with rubbing varnish. Seating, reversible for direction of travel, has been supplied by G. D. Peters & Co. Ltd. It is upholstered in Holdsworth's moquette with Vynide borders and rolls. All cushions are filled with Dunlopillo rubber. The saloon windows, comprising half-drop and horizontal sliding types, have been manufactured by Beckett, Laycock & Watkinson Limited. Glass throughout the car is of Triplex toughened safety quality. The saloon has B.T.H. fluorescent lighting with 30-watt lamps operated on d.c.

The traction equipment has been supplied by Crompton Parkinson Limited and incorporates Vambac control for multi-notch acceleration and rheostatic braking, both operations being effected by a single control lever through the medium of a small pilot motor driving a rotating contact arm inside a circular bank of resistances. Each car has four Crompton motors with a one-hour rating of 45 h.p. at 270 volts. Transmission is by cardan shaft (see our May 16 issue). The Maley & Taunton bogies are of a hornless design suitable for high-speed running, with side-bearers and springing by a combination of steel semi-elliptic springs and rubber springs controlled by dampers. In conjunction with the fully springborne motors, the resilient wheels contribute to smooth and silent running conducive to a standard of passenger comfort that might be envied by some users of ordinary electric train services.

International Union of Railways

Annual meetings of the committees at Lausanne

This year, on the invitation of the Swiss Federal Railways, the meetings of the committees of the International Union of Railways (U.I.C.) were held at Lausanne, beginning on May 26 and concluding on June 7. The usual organisation, which has proved a success in past years, was adhered to, namely, certain committees meeting in the first week and the remainder meeting during the second week, so that joint meetings of two committees are dovetailed into the middle of the period.

Many European railway administrations were represented: Austria, Belgium, Czechoslovakia, Denmark, Finland, France, Germany, Great Britain, Hungary, Italy, Jugoslavia, Netherlands, Norway, Poland, Portugal, Spain, Sweden, and Switzerland.

The two special U.I.C. organisations, the Information Centre covering public relations and publicity matters (C.I.C.E.), and the office for Research and Tests (O.R.E.) were also represented, and the London Transport Executive, recently admitted to the Union as Associate Member, was represented for the first time. As an affiliated body, the International Union of Railway Medical Services (U.I.M.C.) sent a representative.

Other bodies working in the international railway sphere and represented at Lausanne included the International Rail Transport Committee (C.I.T.), the International Carriage and Van Union (R.I.C.), the International Union for Wagons (R.I.V.), the European Timetable Conference, and the Union of European Railway-owned Road Services (U.R.F.). On the Governmental level, there attended representatives of the Economic Commission for Europe (E.C.E.), the Economic Commission for the Far East (E.C.A.F.E.), and the Federal Office of Transport (O.F.T.), which is responsible for the Technical Unity (U.T.).

Work of the Committees

The work of the U.I.C. is carried out by the committees, which process the reports of the various sub-committees and prepare the recommendations for submission to the Board of Management, which customarily meets in Paris towards the end of the year.

Great Britain provides the Chairman of the First Committee (Passenger Traffic); Mr. R. H. Hacker, Chief Officer (Continental), the Railway Executive, presided, and the questions discussed included cruise trains, and reservation of seats.

The Second Committee, under the chairmanship of the Swiss Federal Railways, deals with freight traffic matters. Dr. Hans Dirlewanger presided, and discussions embraced a wide range of subjects, including types of packing, and container traffic.

Under the chairmanship of Belgium, the Third Committee (Finance, Accounts, and Statistics) was presided over by Monsieur E. E. J. H. Desorgher, of the S.N.C.B. Subjects discussed ranged from costing to the standardisation of statistics; problems of exchange with fluctuating currencies proved a particularly intricate matter.

For the Fourth Committee (Operating) Italy provides the Chairman; Signor Cirillo occupied the chair for the first time as successor to his colleague, recently retired, Signor Palmieri, long a well-known and popular figure in international railway circles. Problems studied by the Fourth Committee include the reduction of empty wagon running, the use of the new U.I.C. standard wagons, and signalling methods, particularly in regard to level crossings.

The French National Railways provide the Chairman of the Fifth Committee (Technical Questions), which works through three main sections: electricity, rolling stock, and permanent way. The field is wide, and a very large number of questions is continually under review, such as electric traction, heating of trains, interchangeability of rolling stock parts, and qualities of steel for rails and tyres. Monsieur Parmantier presided at the meetings of the Fifth Committee and its sections.

Besides the five permanent committees, there is a special committee responsible for facilitating exchange of documentation between the various administrations. Great Britain provides the Chairman; Mr. C. E. R. Sherrington, Director of the Research Information Division, British Transport Commission, presided. Questions under review include the preparation of a dictionary of technical railway terms, the working of the Central Documentation Bureau (B.D.C.) in Paris, and exchange of instructional and documentary railway films.

As with all the committee and sub-committee meetings of the U.I.C., all discussions are in French. They are wholly of a "working" character; in this they resemble closely the meetings of the working committees of the Association of American Railroads, the transatlantic counterpart of the U.I.C.

Social functions were limited to a dinner offered by the Swiss Federal Railways, whose President, Dr. Hugo Gschwind, occupied the chair on the first occasion, and whose General Manager, Dr. J. Favre, presided at the dinner in the second week; this was also attended by Monsieur Louis Armand, Director General, S.N.C.F., and President of the U.I.C. There were also receptions by the Municipality of Lausanne jointly with the Canton of Vaud for the delegates attending in each week.

Amongst the British delegates at Lausanne were Messrs. L. H. K. Neil, F. R. Stockdill, T. W. Brown, H. J. Bourn, F. W. Case, L. S. J. Keeys, E. G. Brentnall, C. A. Gammon, H. H. Robinson, W. J. A. Sykes, and W. B. Addinall, of the Railway Executive or its Regions, and Mr. H. R. Broadbent, of London Transport.

Transport Inquiry in Northern Ireland

Evidence relating to Belfast—Bangor and other services, and the combined rail-road workshops

The Northern Ireland Transport Tribunal inquiry into the working of the Ulster Transport Authority resumed its sittings in Belfast on April 21. A summary of the evidence already given appeared in our May 2 issue.

Mr. A. Morrison, Chief Officer (Special Duties), Ulster Transport Authority, handed in a document setting out calculations of the annual cost of providing a substitute road service for the Belfast—Bangor rail service. Existing railway revenue was £135,000 a year. The new diesel sets under construction for the Bangor line would, it was hoped, increase passenger traffic. If rail services had, in the event, to be abandoned between Belfast and Bangor the diesel trains could be used elsewhere. Mr. Morrison estimated that about 20 per cent. of the traffic using the roads could be attracted to the railways of the Authority. If rail services were made reasonably attractive, those who travelled previously by private car might go by train.

The Tribunal agreed to ask Mr. F. A. Pope, former Chairman, Ulster Transport Authority, and now Member, British Transport Commission, to give evidence, as an independent witness, on questions of higher policy, administration and responsibility for decisions, respecting the Authority. Mr. Morrison said that the U.T.A. had considered appointing a public relations officer but nothing had come of it for the reason that they had not seen any benefit that would justify the expense.

Mr. James Courtney, Chief Engineer, U.T.A., gave reasons why the U.T.A. workshops, costing £637,270, were built at Duncrue Street, Belfast, instead of at Queen's Quay, the former Belfast & County Down Railway terminus. Queen's Quay, he said, was subject to corrosion from nearby chemical plant, which had already entailed the removal of much glass roofing. The buildings were unsuitable, because of age and condition, for extension and adaptation. At Duncrue Street they had been able to concentrate all elements of mechanical engineering, body construction and maintenance of both road and rail vehicles. It had reduced staff by 107 and saved £37,450 a year. The works were self-supporting, except for the cost of cylinder heads.

Mr. Courtney went on to give evidence about the purchase of the U.T.A. offices at Linenhall Street. Of the Bangor rail service one of the most important aspects, he said, was the possibility of running the trains into the G.N.R.(I.) terminus, but it would require extensive development there; they had not yet sufficient data on the running costs of the diesel sets.

The Chairman of the Tribunal, Sir Anthony Babington, said that the appointment of a London firm of consultants to examine the organisation and management of the U.T.A.—a matter on which the Northern Ireland Minister of Commerce had made a statement—had no connection with the present inquiry. Counsel for the U.T.A. said that the Authority welcomed the examination as it had nothing to hide.

A spokesman for the Ulster branch of the National Employers' Association of Vehicle Builders asked that the powers which the U.T.A. had for building vehicles other than for its own organisation should be limited in the same way as those of its "opposite number" in Great Britain.

A petition was handed to the Tribunal, signed by residents in County Derry, for the reinstatement of discontinued Derry Central Railway services. Interests representing Ballymoney made known the local wish for the reopening of the Ballycastle—Ballymoney narrow gauge line. It was said that the tourist traffic to Ballycastle had declined noticeably, that the bus services were insufficient and that the facilities for freight were inadequate. Receipts from the railway in 1949 were stated to have been £7,000, compared with expenditure of £21,200. There were complaints from Portrush of the slow train service.

The Tribunal adjourned on May 15 until June 3.

Staff & Labour Matters

Railway Wage Claims

The employees' side of the Railway Shopmen's National Council has submitted an application on behalf of the railway workshop staff. In line with the pay claim already lodged for railway salaried and conciliation staff, the application for workshop staff is for a 10 per cent. increase in pay for workshop supervisors and payment at time-and-a-half for all time worked between noon and midnight on Saturdays. A further meeting to discuss the application for a 10 per cent. pay increase for railway salaried and conciliation staff and for enhanced payment for work performed after noon on Saturdays will take place between Railway Executive and trades union representatives on June 23.

Threatened Strike at London Depots

Last-minute negotiations between the Railway Executive and the N.U.R. averted a stoppage of work at London goods and parcels depots threatened from noon on June 10. The dispute arose through staff at the St. Pancras and Whitecross Street Depots, L.M.R., refusing to handle traffic carted by staff belonging to the Euston Mutual Aid Society, a secessionist organisation of former N.U.R. members.

The Railway Executive, despite discussions with the N.U.R., had been unable to secure a resumption of normal working.

This led to disciplinary action against the staff refusing to handle the traffic; after due warning, 19 men at the two depots concerned were suspended from duty, which resulted in the threatened stoppage by porterage and cartage staffs.

Contracts & Tenders

A contract for 27 bogie tank wagons for the East African Railways & Harbours has been placed with Hurst, Nelson & Co. Ltd. by the Crown Agents for the Colonies.

The New Zealand Government Railways have placed a contract with the Butterley Co. Ltd. for 40 underframes and bogies (exclusive of wheels and axles) for class "F" 30 ft. brakevans, and for one set of wheels and axles.

The Crown Agents for the Colonies have placed a contract with the Gloucester Railway Carriage & Wagon Co. Ltd., for eight bogie goods brakevans. The brakevans are for the Gold Coast Railway.

The North British Locomotive Co. Ltd., has recently received orders for 13 "29" class 2-8-2 and 38 "30" class 2-8-4 locomotives for the East African Railways & Harbours, from the Crown Agents for the Colonies. The locomotives are to be supplied with tenders.

A recent Reuter's report from Sydney states that Pakistan has ordered nine diesel locomotives from the Clyde Engineering Co. Pty. Ltd., Granville, New South Wales, at a cost of about A£1 million. The order is said to be an initial one, as the Pakistan Government probably will seek to purchase its locomotives from Australia in preference to dollar sources.

British and French Railways Staff Exchange

Members of the French team who took part in the exchange of staff between the British and French railways, discussing their six-week visit with Mr. John Elliot, Chairman, Railway Executive. Left to right: M. Gallet, M. Hasenknopf, Mr. Elliot, M. Charbonnaire, M. Forray

The Board of Trade, Special Register Information Service, recently reported a call for tenders by the South African Railways Stores Department for the supply of the following electrical signalling material:—

20 three-aspect long range searchlight signals
100 indication transformers
100 signal resistance units
300 12-way terminal blocks

Copies of the drawings may be obtained from the Office of the Chief Stores Superintendent, Johannesburg, or any S.A.R. Stores Superintendent. The drawing may also be viewed at the Offices of the High Commissioner in London. Tenders should reach the Chairman of the Tender Board, P.O. Box 7784, Johannesburg, by July 3, and the envelope should be inscribed on the outside "Tender No. C4567:—Electrical Signalling Material." A copy of the specification is available for inspection at the Board of Trade, Commercial Relations and Exports Department, by representatives of United Kingdom firms.

Notes and News

Vacancy for Mechanical Engineering Draughtsman.—A mechanical engineering draughtsman is required by a London firm in the Victoria area. See Official Notices on page 671.

Vacancy for Assistant Divisional Transport Officer.—Applications are invited for the post of assistant divisional transport officer in the East Midlands Division, Marketing Department, National Coal Board. See Official Notices on page 671.

Eastern Region Camping Coach Cooking Facilities.—Cooking in the Eastern Region camping coach illustrated on page 582 of our May 23 issue is by oil and not by Calor gas as stated in the caption. The cylinder shown in the left-hand corner of the illustration is a Suvus fire-extinguisher.

Passenger Fares Proposals Discussed.—On Tuesday the Minister of Transport, Mr. A. Lennox-Boyd, attended a Cabinet meeting at which proposals for amendments to railway and bus fares in London and the Provinces were discussed. It is understood that further talks between the Minister and the B.T.C. are likely before changes in fares are announced.

St. Christopher's (Railway Orphanage) Derby.—The annual meeting and distribution of prizes at St. Christopher's (Railway Orphanage) Derby will be held on Friday, June 27, when the Chairman, Mr. Clive E. Bemrose, will preside. The annual meeting will take place in the committee room at 2.15 p.m. and the distribution of prizes, which will be in the dining hall at 3.15 p.m., will be by Sir Ronald W. Matthews, President of the Railway Benevolent Institution, and Lady Matthews. The house will be open to visitors between the hours of 1.30 and 6.30 p.m.

Scottish Region Summer Services.—Between now and the introduction of the summer time-table on June 30, the advertised services in Scotland will be augmented to the extent of over 200 relief trains. The majority of these additional services are to be run at the week-ends; and 96 of the special trains will be for destinations over the border. The "Fife Coast Express" between Glasgow and East Fife is to be restored from June 30. A cross-country service on Saturdays, beginning June 21, will link Edinburgh, Central Scotland, and the Ayrshire Coast. Reserved seats will be available on 949 originating services in Scotland each week, and in addition seats on the majority of long-distance relief trains are also reservable.

International Railway Congress Association.—The Government of India has invited the Association to hold a meeting of the Permanent Commission in India in 1953, probably in New Delhi. The next plenary session of the Congress will be held in London, in 1954.

Modernised Western Region Push-and-Pull Sets.—Two modernised and attractively upholstered coaches have been introduced for push-and-pull service on the Western Region Ealing—Greenford line. They are part of an experiment to produce an up-to-date push-and-pull unit which will be more pleasing and comfortable. In order to ascertain public reaction, comments and suggestions are invited from passengers,

Interior of Western Region improved rail motor car for the Ealing-Greenford line

and those received so far indicate that this new type of vehicle is meeting with general approval. Each of these new units will bear a distinctive name, the two on the Ealing—Greenford service being *Thrush* and *Wren*. Other cars, as they are brought into service on the Western Region, will also bear the names of British birds.

More Shock-Absorbing Wagons for British Railways.—For the conveyance of fragile traffics such as glass, china, and earthenware, the fleet of 3,500 shock-absorbing freight vehicles on British Railways is to be increased to over 5,100 by the end of the year. The bodies of these vehicles, which are known as "Shocks" (open wagons) and "Shocvans" (covered vans), are permitted movement on the chassis, under the restraint of rubber springs. The vehicles will be built in British Railways workshops at Faverdale, Derby, and Ashford.

Restaurant Car Meal Prices.—The Hotels Executive announced last week that, owing to continually increasing cost of operation of the restaurant car services, it had been compelled to advance the prices of meals in restaurant cars. On June 9 the following revised prices came into force on the regular services: Breakfast, 5s. 6d.; breakfast, plain, 3s.; luncheon, 7s. 6d.; and dinner, 7s. 6d. At the same time the Executive introduced a concession to meet the case of the family journey. Children travelling at half fare are now charged at half price for table d'hôte meals in restaurant cars. On the buffet cars, which in response to public demand are now running on 178 trains, the price of a few main items on the light refreshment tariff has been increased.

Electrification to Lyons.—It is reported that during the past few weeks several trains have been hauled electrically throughout between Paris and Lyons, on the completion of the last stage, between Chalon-sur-Saône and Lyons, of this electrification scheme. The Dijon - Chalon section was completed by the beginning of the year, the first electric train running on January 17.

"Flying Scotsman" Summer Schedules.—The down and up timings of the "Flying Scotsman" between London and Edinburgh in the summer timetable will be 7 hr. 39 min. and 7 hr. 38 min. respectively. Arrival at Edinburgh Waverley will be at 5.39 p.m., and at Kings Cross at 5.38 p.m. The latter times were shown incorrectly, as the durations of the journeys on page 619 of our June 6 issue.

Record Steel Carryings by British Railways.—The biggest week's forwarding of iron and steel by British Railways for over a year is recorded for the week ended May 31, when 214,129 tons were conveyed from the principal steelworks. Tonnage of coal conveyed by rail from the deep-mined pits and opencast sites during the 48 hr. ended 6 a.m. on June 9 was 292,700 making a total of 5,607,390 tons for the past fortnight.

Angola Development Projects.—An agency message states that the Portuguese Government has approved projects for Angola involving the extension of railways and the building of a hydro-electric plant. The total cost is estimated at about 190,000,000 escudos. The Mossamedes line in Southern Angola will be extended towards the Northern Rhodesia border. A 119 km. section will be built immediately and new rolling stock will be bought. A further 480 km. extension will be surveyed.

Baskets of Flowers at Cambridge Station.—The Eastern Region of British Railways is continuing this year the provision of hanging flower baskets to decorate Cambridge Station. Twenty such baskets have recently been hung in various positions on the platforms, in the booking hall and at the front of the station. Hanging baskets of flowers were first introduced at Cambridge Station last year in connection with the Royal Show.

Crompton Parkinson Stock Conversion Proposals.—An extraordinary general meeting of Crompton Parkinson Limited will be held at the Connaught Rooms, Great Queen Street, London, W.C.2, on June 26 to consider a resolution for the consolidation into a single class of ordinary stock or shares of the existing £150,000 ordinary stock the £2,927,797 "A" ordinary stock, and the "A" ordinary shares of 5s. The resolution also provides for the capitalisation of £18,750, being part of the company's unallocated revenue reserves, and its application to paying up in full £75,000 ordinary shares of 5s. each. The necessary amendment of the Company's articles of association is also included in the business of the meeting. A statement from the Chairman issued to all stockholders

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

JUNIOR TRAFFIC OFFICIAL with Railway Traffic apprenticeship experience required for the Southern Railway of Peru, age 20/25 years, single, knowledge of Spanish would be an advantage. Apply to the SECRETARY OF THE PERUVIAN CORPORATION LIMITED, 144, Leadenhall Street, London, E.C.3.

FOR SALE. Hangar (all steel) 113′ clear span × 135′ long × 25′ clear height at eaves, rising to 35′ clear at apex. Doors each end (gable optional). Hangar (all steel) 80′ clear span × 144′ long × 22′ clear height at eaves, rising 32′ at apex. Doors one end. Steel building 80′ clear span × 144′ long × 22′ clear height at eaves. Large sliding doors in sides. Curved steel building 35′ span × 17′ 6″ high at apex. Up to 600′ long (low price).—BELLMAN HANGARS LTD., Terminal House, London, S.W.1.

NATIONAL COAL BOARD—EAST MIDLANDS DIVISION

MARKETING DEPARTMENT

APPLICATIONS are invited for the post of Assistant Divisional Transport Officer in the East Midlands Division. Applicants should have experience in transport organisation, including the handling of bulk traffic by rail. The post is graded M.D.6 (£820 × £30 — £1,060 per annum) and the commencing salary will depend upon qualifications and experience. Applications, giving full particulars of age, education, qualifications and experience (with dates) should be addressed not later than 21st June, 1952, to THE SECRETARY, National Coal Board, East Midlands Division, Sherwood Lodge, Arnold, near Nottingham. Envelopes and applications to be marked "S.V.194."

REQUIRED for the Southern Railway of Peru. Locomotive, Carriage and Wagon Senior Draughtsman 30/35 years of age. Qualifications: Must have served a full general apprenticeship in an Engineering workshop (preferably Railway) and have had at least five years' drawing office experience with some time in an executive capacity. A knowledge of Spanish an advantage. Future prospects. Apply to the Secretary, PERUVIAN CORPORATION LIMITED, 144, Leadenhall Street, London, E.C.3.

MECHANICAL ENGINEERING DRAUGHTSMAN required by London Firm in Victoria area. Write stating details of age, experience, qualifications and salary asked.—Box 511, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

REQUIRED for the Central Railway of Peru, Railway Stores Assistant (Clerical). Qualifications: Secondary School Education and holding School Leaving Certificate, preferably with some previous commercial experience. Age from 23 to 30 years. Knowledge of Spanish desirable. Single man preferred with experience in a Stores Department of a British Railway or an Engineering concern. Apply to —THE PERUVIAN CORPORATION LTD., 144, Leadenhall Street, London, E.C.3.

N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10*s.* 6*d.*—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25*s.* per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

announces that the Directors no longer contemplate presenting any proposals for increasing the permanent capital of the Company at the present time or in the near future.

Improved W.R. Train Services to Coast.—To assist holiday travel at weekends, Western Region train services to the West of England are considerably augmented during June, prior to the introduction of the Summer timetable on June 30. The additional services from Paddington include night services to Penzance and Newquay on Fridays; and on Saturdays additional services to Penzance, Kingswear, Paignton, Weymouth Quay, Minehead, Ilfracombe and Plymouth. Augmented services will also be operated on Fridays and Saturdays from South Wales, the Midlands and the North of England, and additional trains will be provided for returning holidaymakers from the West of England.

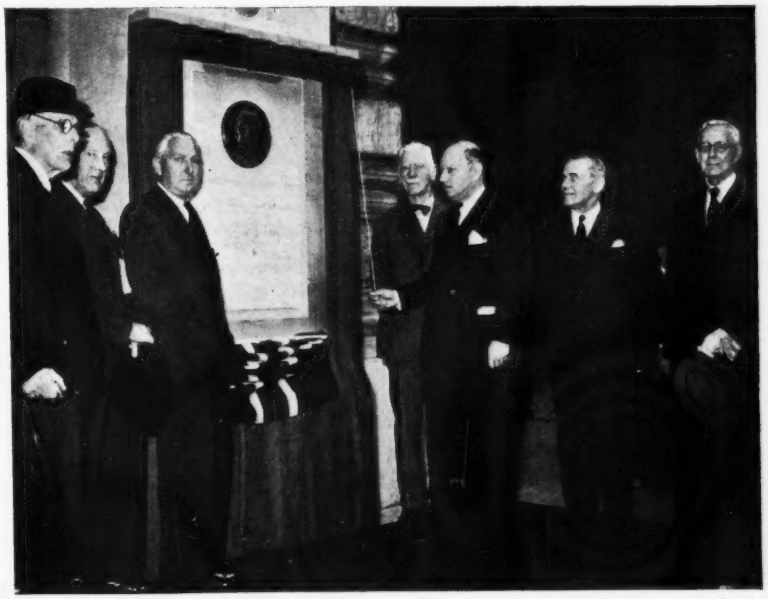
A New Red Lead Primer.—A new red lead primer, known as Evo-Led has been developed by Evode Limited, which it is claimed displaces moisture by absorption and allows it to evaporate together with the solvents during the drying process. It is also said to be particularly suitable for application to structures exposed to sea water, damp or wet surfaces. A further characteristic of the new primer is non-lifting or bleeding even when applied over paints containing searching solvents. One gallon of Evo-Led primer is sufficient to cover from 35 to 50 sq. yd. of surface.

Institute of Traffic Administration Conference.—Speaking at the annual conference of the Institute of Traffic Administration in Birmingham recently, Professor Gilbert Walker, of Birmingham University, said that if the British Transport Commission was to produce a properly co-ordinated transport system, it would have to devise a system of charging that would make main-line train fares lower than those by bus. It was anomalous that at present the railway method of charging a standard fare per mile by every kind of service should encourage passengers to travel by a more expensive form of transport—bus—on long-distance journeys. At the annual dinner, Mr. Frederick Smith, Deputy President of the Institute, responding to the toast given by the Lord Mayor of Birmingham, asked for a new approach to the transport question to prevent the industry from being a victim of continual party bickering. He suggested that the political parties should try to find an agreed solution to the present problems, and give the industry a charter for a period of, say, 20 years during which there would be no major political interference.

Effect of Fuel Tax on Road Transport.—At the annual general meeting of B.E.T. Omnibus Services Limited on June 5, the Chairman, Mr. J. S. Wills, referred to "discriminatory special taxation in the form of additional fuel tax." This, he said, was planned and deliberate and was not an inevitable consequence of anything except perhaps the inability or unwillingness of its authors to foresee or understand its ultimate result. He could not understand how the responsible Ministers of any Government could imagine that their industry, with its finely adjusted balance between revenue and expenditure, could absorb such enormous impositions on the cost of its main raw material and still keep the price of its services unchanged. He then contrasted this gloomy side of the picture with some brighter prospects in the shape of new and improved vehicles, and the measures constantly being taken by the industry to reduce operating costs while maintaining the high standard of service it had so long provided. He welcomed the disappearance of the nationalisation threat implicit in the powers of the B.T.C. to formulate area schemes, which powers, according to the White Paper on Transport, were to be repealed.

Sir Herbert Walker Memorial.—The unveiling of a memorial to the late Sir Herbert Walker, General Manager of the Southern Railway between 1923-37 and afterwards a Director, at Waterloo Station on May 27, by Mr. John Elliot, Chairman, Railway Executive, was referred to in our May 30 issue. In the illustration below are shown:—

Left to right: Sir Francis Dent, a former Director; Mr. E. B. Baring, a former Director; Sir Eustace Missenden, Chairman, Railway Executive, 1947-51, and formerly General Manager, Southern Railway; Sir John Thornycroft, a former Director; Mr. Elliot; Messrs. Gilbert Szlumper, a former General Manager; E. C. Cox, a retired Traffic Manager.



Mr. John Elliot unveiling the memorial to the late Sir Herbert Walker at Waterloo Station on May 27 (see paragraph above)

Combined Rail-Road Excursions in N.E. Area.—Arrangements have been made by the North Eastern Region, in co-operation with various associated road companies, to extend the programme of regular rail-road day excursions available to the public this summer. Bookings are being given at an inclusive cheap fare by ordinary trains on specified days from certain stations, with a road tour included as part of the journey.

Railway Book Exhibition.—The National Book League is to hold an exhibition of railway books, prints and models at its galleries, 7, Albemarle Street, London, W.1, from September 9 to November 5 next. The exhibition will be international in character and will, it is hoped, present a complete survey of railway literature from the earliest days to the present. The organisers, Mr. P. Morton Shand and Mr. Harold Wyatt (the latter was the organiser of the railway exhibits at the South Bank Exhibition last year) would welcome offers of exhibits, early books, guides, prints, tickets, sheet timetables, and similar material for consideration. Offers, which should be received by July 1, 1952, should be addressed to the Joint Organisers, Railway Book Exhibition, The National Book League, 7, Albemarle Street, London, W.1. (Tel: REGent 1201-5.)

Closing of N.E. Region Branch Lines.—Passenger train services between West Hartlepool and Ferryhill *via* Castle Eden, and between West Hartlepool and Sunderland *via* Wellfield, were withdrawn on June 9, both services having been running at a considerable loss. Stations affected by these withdrawals are: Hart (so far as the Castle Eden line is concerned), Hesleden, Wingate, Trimdon, Coxhoe Bridge, West Cornforth, Wellfield, Thornley, Shotton Bridge, Haswell, and South Hetton. Excursion trains will be run during the summer on certain days to the coast, including a number on Saturdays and Wednesdays from July 5 to August 16 inclusive. Parcels traffic continues to be accepted at Coxhoe Bridge, Trimdon, Castle Eden, Haswell, Wingate, West Cornforth and Murton; and a collection and delivery service is being operated from railheads by British Railways vehicles. There has been no change in the method of dealing with goods traffic.

Forthcoming Meetings

June 14 (*Sat.*) to 19 (*Thu.*).—Permanent Way Institution, 1952 Summer Convention at Ipswich.

June 14 (*Sat.*).—British Railways, Southern Region, Lecture & Debating Society. Social ramble over the course of the former Surrey Iron Railway.

June 16 (*Mon.*) to 20 (*Fri.*).—Institution of Civil Engineers, Great George Street, Westminster, S.W.1. Conference on Civil Engineering Problems in the Colonies.

June 19 (*Thu.*).—British Railways, Southern Region, Lecture & Debating Society. Visit to Ambassador and Paddington telephone exchanges, at 6.15 p.m.

June 19 (*Thu.*) to 24 (*Tue.*).—Railway Students' Association. Annual Convention, at St. Regulus Hall, University of St. Andrews, Fife.

June 23 (*Mon.*) to 25 (*Wed.*).—British Wood Preserving Association. Annual Convention at the Queen's College, Cambridge.

Railway Stock Market

The recent sharp decline of values in stock markets has attracted a little buying, and prices strengthened in most sections. British Funds have been helped by the £62,000,000 decline in bank advances last month, which has increased hopes in the City that a further rise in the bank rate is improbable, more particularly as the value of sterling in terms of U.S.A. dollars now has a steadier appearance at 2·78¾. Industrial shares have taken their cue from gilt-edged stocks, though buyers were attracted by the generous yields. Yields in many cases are now at their highest levels since 1945, despite reasonable prospects that the majority of companies will be able to maintain dividends at last year's rates unless there is a general trade recession.

The difficulty of assessing the position of individual companies in regard to E.P.L. and the increase in the distributed profits tax, are factors which continue to make for caution. In due course many companies are expected to issue a statement on their E.P.L. position. This, it is thought, would greatly help shareholders, many of whom have insufficient data on past earnings to estimate E.P.L. An important point is that E.P.L. statistics usually are calculated on the basis of profits at last year's levels, which in many cases were exceptionally good. Lower profits will be the rule this year, so that E.P.L. will not bear so heavily as it would if last year's earnings were maintained.

The foreign railway market has been rather more active, with a rally in Antofagasta stocks the main feature. The ordinary strengthened to 10½ after their recent decline, while the preference stock recovered to 56, helped by the latest traffic figures and by revived talk that there may be prospects of a scheme of some kind to fund remaining preference dividend arrears. Nevertheless, the latter is not regarded as practicable unless the position justified hopes of resumption of dividends on the ordinary stock.

United of Havana, however, have encountered some selling and the 5 per cent. debentures receded to 13. Leopoldina stocks, after their recent firmness, turned easier with the ordinary at 11 and the preference 28.

Brazil Railway bonds kept at 5¼, but San Paulo 10s. ordinary units have been less firm at 12s., while Nitrate Rails shares eased to 20s. 6d. after reports indicating some contraction in demand for nitrate and the latest Chilean currency developments. Taltal railway shares were 15s.

Mexican Central "A" debentures have not held best levels at 71½. Manila "A" debentures kept steady at 76, and the preference changed hands around 8s. Leopoldina Terminal debentures were lower at 21 with the ordinary shares quoted at 8½d.

The better trend in dollar stocks helped Canadian Pacifics at $65. The 4 per cent. debentures were 79½ and the 4 per cent. preference 62¾.

In other directions, Metropolitan Assented have been a home feature, with dealings around 40¾, attention being drawn to the good yield. Interest at 3 per cent. is guaranteed on this stock by the Government until 1958, when holders of each £100 of stock will receive in exchange £45 7s. of British Transport 3 per cent. stock (1978-88). Paraguay Central 6 per cent. debentures have marked 19½, Nyasaland Railway 3½ per cent. first debentures transferred at 72.

Road transport shares have been steady, helped by the good impression created by the Maidstone & District results and maintained 20 per cent. dividend. Shares of the latter were firmly held and quoted at 57s. 6d. Southdown were 75s., West Riding 30s., and Lancashire Transport 38s. Devon General kept at 105s., B.E.T. Omnibus Services at 38s. 9d. and Aldershot and District at 60s. Elsewhere, B.E.T. deferred stock moved lower at £350.

Engineering and kindred shares continued fairly steady, with Guest Keen around 49s. and Babcock & Wilcox 60s. 9d. T. W. Ward were 69s.; John Brown (39s. 6d.) were inclined to rally on market talk of possibilities of a dividend increase. British Aluminium were 37s. 9d.

Fears that American developments might lead to a cut in steel supplies in the United Kingdom affected sentiment in engineering shares earlier in the week. Ransome and Marles were 22s. 3d., Metal Industries 35s. 6d., and Brown Bayleys 92s. 6d.

Among locomotive builders and engineers, Vulcan Foundry changed hands around 21s. 3d., North British Locomotive were 14s. 1½d., Charles Roberts 5s. shares 20s., Gloucester Wagon 10s. shares 11s., and Wagon Repairs 5s. shares 11s. 6d. Beyer Peacock at 28s. have been firm, while G. D. Peters 5s. shares were 16s. 3d., and Birmingham Carriage 32s. 3d. At Glasgow, Hurst Nelson remained around 49s.

Traffic Table of Overseas and Foreign Railways

	Railway	Miles open	Week ended	Traffics for week: Total this year	Traffics for week: Inc. or dec. compared with 1949/50	No. of week	Aggregate traffics to date: Total 1950/51	Aggregate traffics to date: Increase or decrease
South & Cen. America	Antofagasta ...	811	30.5.52	£ 210,200	+ £ 55,960	22	£ 3,409,940	+ £ 999,400
	Costa Rica ...	281	Apr., 1952	c1,422,467	+ c649,068	44	c12,846,176	+ c3,234,296
	Dorada	70	Mar., 1952	32,729	— 1,506	13	102,429	— 5,679
	Inter. Ctl. Amer....	794	Apr., 1952	$1,085,825	+ $214,744	17	$4,754,984	+ $130,795
	Paraguay Cent. ...	274	28.12.51	G289,547	+ G102,688	26	G8,823,911	+ G3,556,978
	Peru Corp. ...	1,050	Apr., 1952	$8,694,000	+ $968,000	44	$83,332,000	+ $6,935,000
	,, (Bolivian Section)	66	Apr., 1952	Bs.16,397,000	+ Bs.361,000	44	Bs.161,744,000	+ Bs.35,241,000
	Salvador	100	Mar., 1952	c225,000	— c11,000	39	c1,607,000	+ c44,000
	Taltal	147	Apr., 1952	$2,267,000	+ $342,000	44	$22,160,000	+ $5,547,000
Canada	Canadian National†	23,473	Mar., 1952	19,412,000	+ 1,858,000	13	53,914,000	+ 6,274,000
	Canadian Pacific† ...	17,037	Apr., 1952	11,982,000	+ 300,000	17	47,926,000	+ 3,542,000
Various	Barsi Light* ...	167	Apr., 1952	37,260	— 2,970	4	37,260	— 2,970
	Gold Coast ...	536	Mar., 1952	321,377	+ 34,061	52	3,475,842	+ 335,178
	Mid. of W.Australia	277	Mar., 1952	52,253	+ 11,130	39	522,599	+ 165,102
	South Africa ...	13,398	10.5.52	1,996,041	+ 73,296	6	11,459,395	+ 680,557
	Victoria	4,744	Jan., 1952	2,265,953	+ 274,972	30	—	—

* Receipts are calculated at 1s. 6d. to the rupee † Calculated at $3 to £1